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**TWO NEW GENERA RELATED TO ACROCERCOPS
(GRACILLARIIDAE, LEPIDOPTERA), WITH FIVE
NEW SPECIES FROM THE ORIENTAL REGION**

By TOSIO KUMATA

Research Trips for Agricultural and Forest Insects in the Subcontinent of India,
Scientific Report No. 38.

Systematic and Ecological Surveys on Some Plant-Parasitic Microarthropods
in Southeast Asia, Scientific Report No. 5.

Abstract

Kumata, T. 1989. Two new genera related to *Acrocercops* (Gracillariidae, Lepidoptera), with five new species from the Oriental Region. *Ins. matsum. n. s.* 42: 47-82, 19 figs. (13 text-figs., 6 pls.).

Monocercops (gen. nov.) is erected for *Acrocercops resplendens* (Stainton, 1863) and three new species, and *Dekeidoryxis* (gen. nov.) for *Parectopa asynacta* Meyrick, 1918 and two new species. *Monocercops resplendens* (comb. nov.) and *Dekeidoryxis asynacta* (comb. nov.) are redescribed, and *Maesa chisia* is recorded as a food plant of the latter. *Monocercops nepalensis* (Nepal, on *Castanopsis indica*), *M. thoi* (Malaysia, on *Castanopsis inermis*), *M. triangulata* (Nepal, on *Castanopsis* sp.), *Dekeidoryxis maesae* (India and Nepal, on *Maesa chisia* and *M. macrophylla*), and *D. khooi* (Malaysia, on *Maesa ramentacea*) (spp. nov.) are described. Genitalia are illustrated whenever available, and wing venations for some species. The larval chaetotaxy is also illustrated for the representatives of the new genera.

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INTRODUCTION

This paper is my third report (following Kumata, 1973 and 1985) on the gracillariid material collected from Nepal and India in connection with the projects "Hokkaidō University Scientific Expedition to the Himalaya", 1968 and "Research Trips for Agricultural and Forest Insects in the Subcontinent of India", 1978 and 1983. Additional specimens from Nepal, collected by staff of the British Museum (Natural History), are also used. On this occasion two species collected by me in Malaysia under the project "Systematic and Ecological Surveys on Some Plant-Parasitic Microarthropods in Southeast Asia", 1986 should be included in this paper.

In the course of my taxonomic studies based on these collections I have found two new genera related to *Acrocercops*: one of them, named *Monocercops*, is to receive *Acrocercops resplendens* (Stainton) and three new species, and the other, *Dekeidoryxis*, is to include *Parectopa asynacta* Meyrick and two new species. The members of the genus *Monocercops* emerged from larvae mining in the leaves of *Castanopsis* spp. (Fagaceae) except *M. resplendens*, which emerged from *Shorea robusta* (Dipterocarpaceae). On the other hand, the species belonging to the genus *Dekeidoryxis* are exclusively associated with *Maesa* spp. (Myrsinaceae).

Depositories of the type specimens are indicated under "Specimens examined" as follows: BMNH=British Museum (Natural History), London; EDAK=Entomological Division, Department of Agriculture, Kathmandu; EIHU=Entomological Institute, Hokkaidō University, Sapporo; FRIM=Forest Research Institute of Malaysia, Kuala Lumpur; ZSIC=Zoological Survey of India, Calcutta.

GENUS MONOCERCOPS NOV.

Type-species: *Gracilaria resplendens* Stainton, 1863.

Etymology: *Monocercops* (G.)=monos (one, single)+cercos (tail)+ops (eye); feminine.

♂ ♀. Face smooth-scaled; head smooth, with a small tuft of scales above eye more or less extending forwards beyond vertex in some species including type-species; ocelli absent; proboscis moderately developed, naked. Maxillary palpus porrect, smooth, pointed apically, 1/2 to 2/3 as long as apical segment of labial palpus. Labial palpus moderately long, slender, upturned; second segment smooth or very slightly roughened below towards apex; apical segment smooth wholly, long-pointed apically, about as long as the second. Antenna 1.2 to 1.8 times as long as fore wing, filiform, simple in both sexes; scape slightly flattened, below with a minute flap of scales acutely projecting beyond apex of scape in all species, and in most species with a more or less developed tuft of hairy scales above. All legs rather long, slender, smooth-scaled except for hind tibia which bears a row of bristly scales above and below, the lower bristly scales being much shorter than the upper ones and sometimes indistinct; first segment of hind tarsus also bearing a row of shorter bristly scales above, the scales diminishing towards apex of the segment.

Fore wing (Fig. 16: A-C) narrowly lanceolate, rather acutely pointed apically; discoidal cell long, occupying about 4/5 of wing, nearly parallel-sided, obliquely truncate apically, with upper vein obsolescent on proximal part far basal to a point where the vein R_1 branches off; 13-veined, with veins all separate; R_1 short, running

from basal 2/5 of cell to about middle of costa; R_2 from upper angle of cell; M_3 from lower angle of cell; Cu_{1a} well remote from M_3 , far basal to level of R_2 ; Cu_{1b} distinct only its apical part, well remote from Cu_{1a} ; An obsolescent entirely, probably connected with hind margin of wing at basal 1/4; ground colour yellowish- or ochreous-brownish, with glossy white marks as follows: two triangular blotches near base and in middle, a quadrangular one near apex and two minute dots or stripes in disc between median and preapical blotches. Hind wing very narrow, about half as wide as and about 5/6 as long as fore wing, long-pointed apically, with cell opened between M_2 and M_3 ; 7-veined; M_1 and M_2 stalked; M_3 and Cu_{1a} stalked and their common stem also stalked with Cu_{1b} ; Cu_2 and An invisible; cilia long, 4-5 times of wing-width; ground colour dark grayish, without markings.

Male genitalia: Tegumen long, slender, longitudinally sclerotized on lateral surfaces, with a narrowly sclerotized dorsal band crossing at about basal 1/3; fine setae usually aggregated around middle, and not appearing around apex; tuba analis membranous, without subscaphium. Valva somewhat wing-shaped, more or less expanded or convex on ventral margin beyond basal 1/3 or middle, with round or blunt apex slightly bent ventrally; some thickened setae forming a comb in disc in two species including type-species, or no such setae in *M. thoi* (sp. nov.); usual fine setae occurring densely in disc beyond basal 1/3 or middle; androconial scales occurring on outer surface densely in type-species or sparsely in the other species. Vinculum U- or V-shaped, rather slender, with saccus rather short, round or narrow. Aedeagus moderately long, tubular; vesica always with a bundle of needle-shaped cornuti near apex of aedeagus. Eighth abdominal segment longer than the seventh, deeply incised ventrally, the incision reaching caudal margin of the preceding segment; a single dorsal apodeme moderate in length, dilate basally, with its median sclerotization or dorsal ridge not extending onto the tergite; a pair of ventral invaginations opening on depth of incision, string-like, slightly capitate, not containing any androconial scale. Seventh abdominal segment normal in structure as in the preceding segments.

Female genitalia: Papillae anales forming an anal tube, shortly united dorsally, covered with usual fine setae and microspines on caudal area; apophysis posterioris moderately long, widened basally. Eighth abdominal segment shortly sclerotized dorsally, weakly membranous ventrally; apophysis anterioris as long as or a little shorter than apophysis posterioris, slightly widened basally. Ostium bursae placed on ventrum of eighth abdominal segment, rather large in opening, ventrally covered with slender lamella antevaginalis; antrum long to moderate, well sclerotized on caudal area or having a ring-shaped sclerite; ductus bursae long, slender, tubular, lined with acute spines at caudal end and with round spines on cephalic area; corpus bursae large, ellipsoidal or reversed-pyriform, densely lined with needle-shaped spines around a single signum which is surrounded by lanceolate sclerites of various size as in *Acrocercops*; ductus seminalis opening at cephalic end of antrum.

Body chaetotaxy of last instar larva (Fig. 17: A): Larvae of *M. thoi* (sp. nov.) alone are available for the present study.

Seta XD2 present on prothorax. Lateral group consisting of 2 setae on all body segments except for ninth and tenth abdominal segments, L3 absent on prothorax and L2 absent on other segments; L1 longer than L3 on abdominal segments as in most genera of the *Acrocercops*-group. On first to ninth abdominal segments, D1

apart from and anterolateral to D2. Subventral group consisting of one seta on first and seventh to ninth abdominal segments, two setae on the second, and three setae on the third to sixth as in *Dialectica*, *Eteoryctis* and *Gibbovalva*. Seta V1 present on all abdominal segments as in *Dialectica*. Proprioceptor MD1 present on all abdominal segments except for the tenth, while MV3 absent on the eighth to tenth as in most genera of *Acrocercops*-group.

Arrangement of crochets: Ventral prolegs on third to fifth abdominal segments with uniordinal crochets arranged in a circle as in *Acrocercops* and *Dialectica*. Anal proleg with similar crochets arranged in a semicircular row rather transverse to body axis.

Larval habit: All the species of the genus are leaf-miners in the larval stage, the mine being found on the upper or lower surface. The mine is started in a linear epidermal gallery from discal area of leaf usually near the mid vein, irregularly curved or running along veins, then it is widened into an elongate blotch along the margin of the leaf. In matured condition, the leaf is folded upward or downward at the widely mined part as in the mines of some species of the genus *Phyllonorycter*. When full-grown, the larva changes the body colour into crimson-red as usual in the *Acrocercops*-group. The pupation takes place inside the mine under the folded leaf-margin, elliptical in outline, without any bubble on the surface.

Remarks: This new genus surely belongs to the *Acrocercops*-group defined by Kumata et al. (1988) in the short anal vein of the fore wing, the bristly hind tibia, the long intersegmental membrane between the eighth abdominal segment and the genital organs in male, the long androconial scales present on the outer surface of the male valva, the mesothorax and metathorax of the last instar larva with two lateral setae, etc.

It is somewhat similar to the genus *Acrocercops* in the genital structures of both the male and female and in the arrangement of the crochets on the ventral prolegs of the larva, but is at once distinguished from the latter by the fore wing with veins all well separate, by the antennal scape with a minute flap below and a tuft above in some species, by the long tegumen sclerotized only on the lateral surfaces longitudinally and having a sclerotized dorsal band at the basal 1/3, by the different type of the comb of the valva, by the corpus bursae having only one signum, and more essentially by the seta XD2 present on the prothorax of the last instar larva. On the other hand, it is related to the genus *Dialectica* in the larval chaetotaxy and the colour-pattern of the fore wing, but is distinguished from the latter by the separated veins R5 and M1 of the fore wing, by the normal form of the male seventh abdominal segment, by the presence of the paired ventral invaginations of the male eighth abdominal segment, by the different form of the signum, and by the presence of the proprioceptor MD1 on the ninth abdominal segment of the larva. In spite of all these differences it should be closer to the genus *Dialectica* than to *Acrocercops*.

Four species are recognized here as members of the new genus; among them the type-species is associated with the genus *Shorea* (Dipterocarpaceae), while the other species are all with the genus *Castanopsis* (Fagaceae).

Key to the species of *Monocercops*

1. Thorax white dorsally ; antennal scape white, smooth above, without dorsal tuft ; fore wing with two short, white stripes in disc between median triangular white blotch and preapical quadrangular one ; female antrum membranous, with a short, ring-shaped sclerite at its cephalic extremity ; [leaf-miner on *Castanopsis* sp.]. *M. triangulata* sp. nov.
- Thorax brownish dorsally ; antennal scape grayish, with a more or less developed tuft above ; fore wing with two minute white dots in disc before preapical quadrangular blotch ; female antrum more or less sclerotized wholly, somewhat weakened caudad, without such a ring-shaped sclerite. 2
2. Fore wing with two white dots in disc just before preapical white blotch arranged in a line parallel to internal margin of the blotch ; male tegumen with many (more than 35) setae on each side around its middle ; male vinculum U-shaped in ventral view, somewhat angulated laterally, with saccus round and plate-like ; male valva with a straight comb consisting of 8-13 apically curved teeth ; female signum surrounded by very long lanceolate sclerites, the longest sclerite being as long as or longer than apophysis posterioris ; leaf-miner on *Shorea robusta*. *M. resplendens* (Stainton)
- Fore wing with two white dots arranged in a line oblique to internal margin of the preapical white blotch ; male tegumen with some (less than 20) setae on each side around its middle ; male vinculum Y-shaped in ventral view, not angulated laterally, with saccus slender and cylindrical ; male valva with a fan-shaped comb consisting of 25-30 straight teeth or without any comb ; female signum surrounded by shorter lanceolate sclerites, the longest sclerite being at most 1/3 as long as apophysis posterioris ; leaf-miner on *Castanopsis* spp. 3
3. Dorsal tuft of antennal scape shorter than 1/2 length of head ; male valva with a fan-shaped comb in its disc ; female signum round ; leaf-miner on *Castanopsis indica*. *M. nepalensis* sp. nov.
- Dorsal tuft of antennal scape a little longer than head ; male valva without any comb in its disc ; female signum somewhat pyriform, partly prolonged caudad ; leaf-miner on *Castanopsis inermis*. *M. thoi* sp. nov.

Monocercops resplendens (Stainton), comb. nov.

[Figs. 1, 2, 5(A), 6(A), 14(A-B) and 16(A)]

Gracilaria (!) *resplendens* Stainton, 1863, Trans. Ent. Soc. Lond., ser. 3, 1 : 294, pl. 10, f. 4 [India (Calcutta)].

Acrocercops resplendens : Meyrick, 1908, Journ. Bomb. Nat. Hist. Soc. 18 : 818 [India (Khasi Hills)] ; Ibid., 1937, Exot. Microlep. 5 : 110 [India (Dehra Dun) ; host : *Shorea robusta*].

Original description : "Exp. al. 4 1/2 lin.

Head white, with a small ochreous-white tuft on each side above the eyes. Face whitish. Maxillary and labial palpi whitish. Antennae longer than the anterior wings, dark grey ; the basal joint rather thickened, and above with a short projecting tuft of grey scales as in *Coleophora*.

Anterior wings rich yellowish-brown, with three large transverse pearly white spots. The first somewhat triangular, near the base, broadest on the inner margin, its apex only just reaching the costa ; the second more completely triangular, nearly in the middle of the wing, its base on inner margin, its apex almost reaching the costa, but not touching it ; the third spot is towards the apex, rather obliquely placed, and rather broader on the costa than on inner margin ; all three are dark-margined on both sides ; beyond the black outer margin of the last spot are two black streaks in the pale brown cilia ; cilia of the inner margin grey.

Posterior wings dark grey, with grey cilia.

Legs white, the ends of the tibiae dark grey and the tarsi spotted with grey."

Additional description : ♂ ♀. Expanse of wings : 6.7-9.9 mm (8.57 mm on average of 13 specimens). Length of fore wing : 3.2-4.7 mm (4.08 mm on average of 14

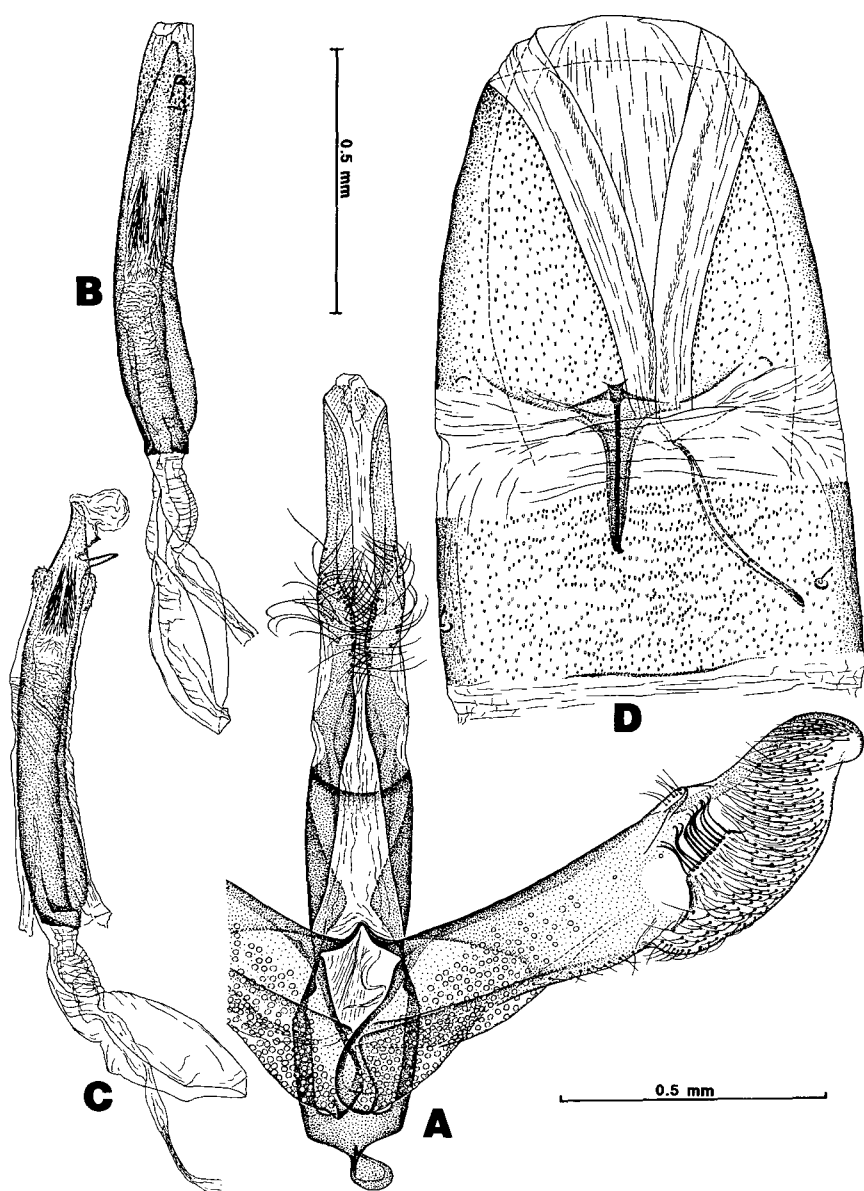


Fig.1. *Monocercops resplendens* (Stainton). A : Male genitalia in caudal view, aedeagus and left valva omitted [Grc-3538] — B: Aedeagus [ditto] — C: Ditto[Grc-1499] — D: Seventh and eighth abdominal segments of male in ventral view[Grc-3538].

specimens).

Maxillary palpus with a blackish stripe on outer surface near apex. Second segment of labial palpus very slightly tufted with scales below, with a dark brownish stripe on outer surface. Thorax grayish brown, darkened posteriorly, with a minute white spot at posterior corner. Anterior four femora fuscous; fore tibia with two blackish rings near apex; middle tibia blackish towards base and ringed with black apically like fore tibia, with its spurs blackish; hind tibia ochreous-brown together with its bristly scales except for white apical extremity, with its apical spurs blackish; all tarsi with four or five blackish rings, the rings on hind tarsus are much broader than those on fore and middle tarsi. Abdomen dorsally dark fuscous, and ventrally silvery-whitish with five fuscous oblique bands; anal extremity black.

Fore wing as described originally, but two minute, dark-margined white dots are placed in disc just before the third white spot as redescribed by Meyrick (1908); they are always arranged in parallel with inner margin of the spot (see Fig. 5: A); two black lines in cilia are convergent towards hind margin of wing, and preceded by white cilia.

Male genitalia (Figs. 1; & 6: A): Tegumen long, slender, weakly sclerotized laterally, with many long setae around apical $2/5$, and with a sclerotized dorsal band at about basal $1/3$. Valva narrowly wing-shaped, widely convex on ventral margin beyond middle, with round apex slightly bent ventrally; costal margin nearly straight, with a small protuberance of apical $1/3$ where a few fine setae are present; 8 to 13 (mostly 11) moderately long, thick and apically curved setae arranged in a straight line to form a comb at apical $1/3$; slender setae densely occurring on inner surface from convex ventral area to apex; long, slender androconial scales densely occurring on outer surface near base. Vinculum short, angulated laterally in ventral view, with a round, plate-like saccus. Aedeagus about $2/3$ as long as valva, tubular, narrowing apically; vesica with a bundle of needle-shaped, fine cornuti, a spatulate projection and an acute spine near apex of aedeagus; a tube-like anellus bearing minute spines near apex of aedeagus. Eighth abdominal segment with a dorsal apodeme moderate in length and ventral invaginations slender and about twice as long as dorsal apodeme; an irregular row of fine spines occurring along mesal margins of deep ventral incision. (Six slides examined.)

Female genitalia (Fig. 2): Papilla analis rather short, covered with usual setae and microspines on caudal area; apophysis posterioris moderate in length, widened basally. Eighth abdominal segment short, nearly as long as papilla analis, with its apophysis nearly as long as apophysis posterioris. Ostium bursae rather large, ventrally margined with a narrow lamella antevaginalis; antrum about as long as apophysis, narrowing cephalad, with its sclerotization weakened caudad; ductus bursae slender, long, membranous, lined with acute spines on caudal extremity and also with round spines on cephalic $1/3$; corpus bursae membranous, large, reversed-pyriform, with a single round signum surrounded by many slender lanceolate sclerites of various length, the longest sclerite being as long as or longer than apophysis; corpus bursae densely lined by needle-shaped spines around signum. (Seven slides examined.)

Specimens examined: 6♂♂ & 10♀♀. NEPAL — 1♂ & 1♀, Adhabar (alt. 300 m), Terai, Narayani, 27/vi/1968, T. Kumata leg.; 3♀♀, Narayangarh (alt. 300 m), Terai, em. 6-9/viii/1983, ex *Shorea robusta* (Np1-253), T. Kumata leg.; 2♀♀, Pathraia (alt. 300 m), Narayani, em. 21-22/ix/

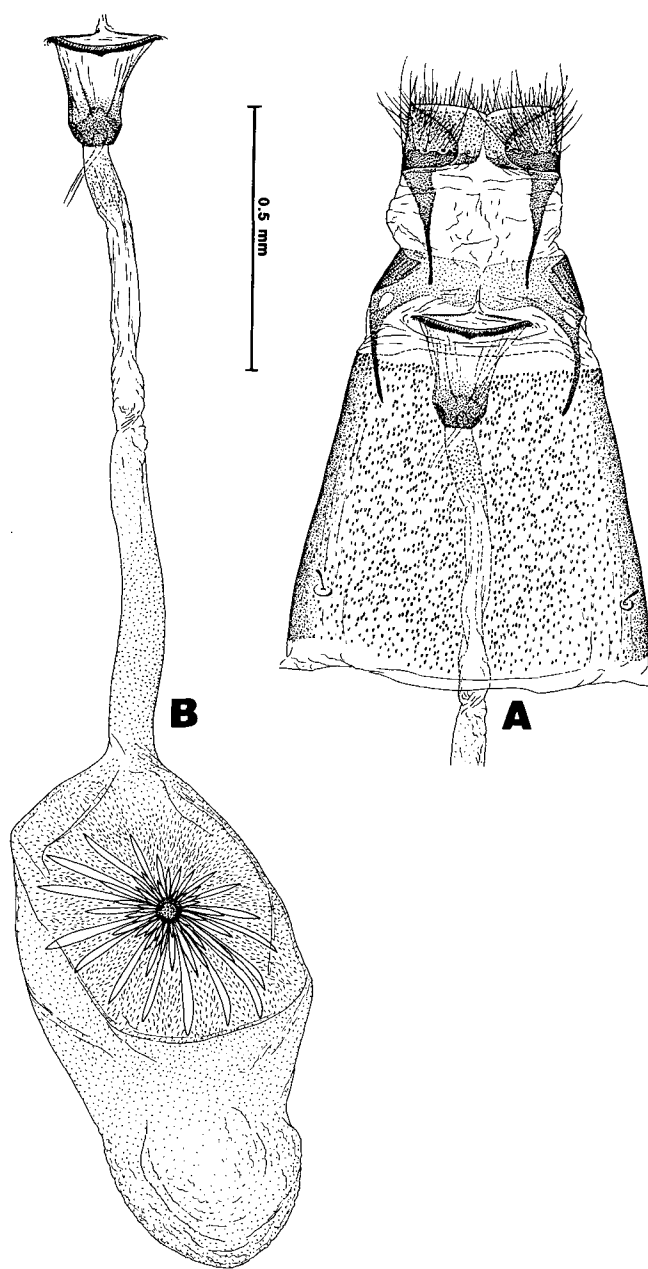


Fig. 2. *Monocercops resplendens* (Stainton). A: Female terminalia in ventral view, bursa copulatrix omitted [Grc-3222] — B: Bursa copulatrix [ditto].

1983, ex *S. robusta* (Npl-472 & 474), T. Kumata leg.; 3 ♀♀, Ditto, 9-10/ix/1983, T. Kumata leg.; 1 ♂, Dharan (alt. 330 m), Terai, 18/viii/1984, M.G. Allen leg.; 1 ♂, Kakani (alt. 2,000 m), Kathmandu Valley, 30/vii/1983, T. Kumata leg.; 1 ♀, Kathmandu city, vii-viii/1982, M.G. Allen leg.; 1 ♂, Balaju—Jamachok (alt. 1,400-2,000 m), Kathmandu Valley, 25/ix/1983, T. Kumata leg.; 1 ♂, Godawari (alt. 1,500-2,000 m), Kathmandu Valley, 14-16/ix/1983, T. Kumata leg.; 1 ♂, Simigaon (alt. 2,000 m), Rolwaling Valley, Janakpur, 24-25/viii/1983, T. Kumata leg.; 1 ♂ & 1 ♀ in BMNH, 2 ♂♂ & 2 ♀♀ in EDAK and the other specimens in EIHU.

Distribution : India (W. Bengal; Assam; Uttar Pradesh), and Nepal (new record).

Food plant : *Shorea robusta* Gaertn. (Dipterocarpaceae).

Remarks : The present specimens are identified after my comparison with the holotype (abdomen missing, labelled "Calcutta, Atkins., 1858", "*Gracilaria splendens*", "Holotype, *Gracilaria resplendens* Stainton") deposited in BMNH.

M. resplendens is characterized by the two white dots arranged in a line parallel to the internal margin of the preapical white blotch of the fore wing, although this character was neglected by Stainton in his original description and figure. It is also peculiar in having some modified setae forming a straight comb on the male valva and very long lanceolate sclerites surrounding the round signum of the female corpus bursae. It is also unique in host plant, occurring on leaf of *Shorea robusta* (Dipterocarpaceae), whereas the other members described below are all leaf-miners of *Castanopsis* spp. (Fagaceae).

Monocercops nepalensis sp. nov.

[Figs. 3, 4, 5(B), 6(B), 14(C-D), 16(B) and 18(A)]

♂♀. Expanse of wings : 6.2-9.5 mm (9.5 mm in holotype, 8.04 mm on average of 17 specimens). Length of fore wing : 2.9-4.6 mm (4.5 mm in holotype, 3.84 mm on average of 18 specimens).

The external structure and colour-pattern of the new species are very similar to those of the preceding *M. resplendens*, but the following characters may serve to recognize the new species.

Thorax and fore wing light yellowish-brown in ground colour, always lighter than those of *M. resplendens*; two minute white dots occurring in the disc before the preapical white mark are arranged in a line oblique to the inner margin of the mark (see Fig. 5 : B).

Male genitalia (Figs. 3; & 6 : B) : Tegumen with 13-17 (mostly 15) fine setae on its median area along ventral margin of each lateral sclerite. Valva a little longer than tegumen, more convex on ventral margin beyond basal 1/3, with apex pointing ventrad; costa sinuate, without a median protuberance; 25-30 moderately thick setae gathered in middle of disc near costa to form a fan-shaped comb as in *Spulerina*; apical half of inner surface of valva densely covered with fine setae and basal half of outer surface sparsely covered with moderately long and slender androconial scales. Vinculum short, somewhat triangular in ventral view, with apical saccus shortly cylindrical. Aedeagus about 3/4 as long as valva, tubular, obliquely truncate apically; vesica having only a bundle of needle-shaped cornuti. Eighth abdominal segment with dorsal apodeme elongate-triangular and ventral invaginations about 1.5 times as long as the apodeme; mesal margins of ventral incision without any spines. The other characters are as in the preceding *M.*

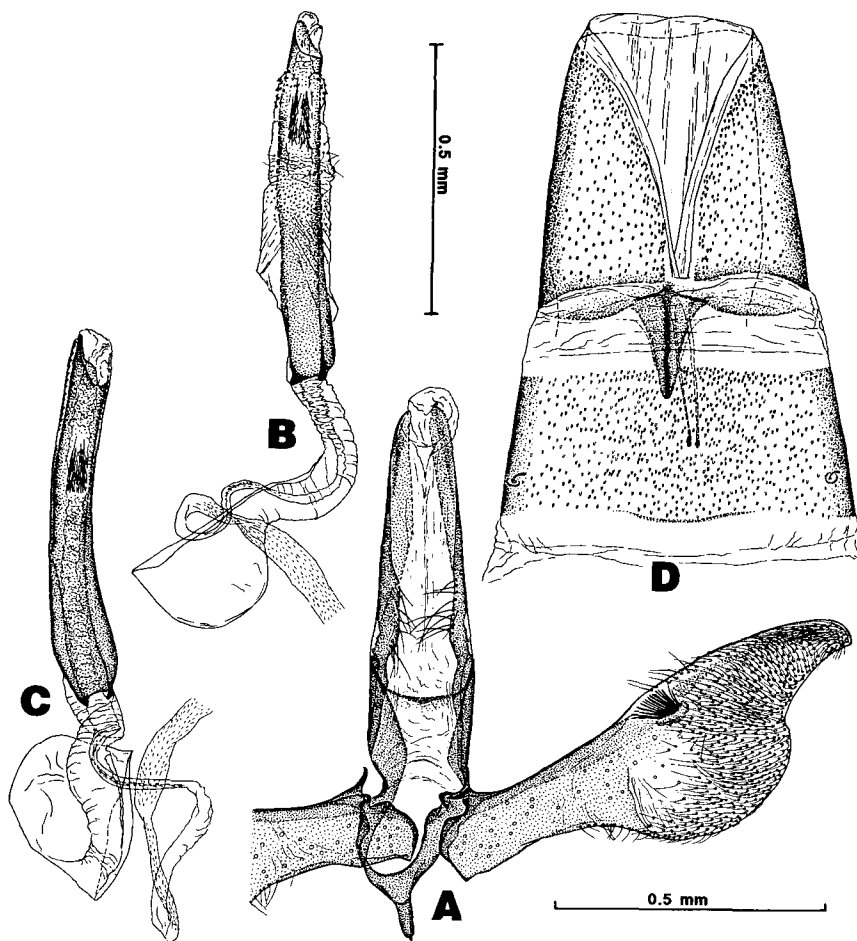


Fig. 3. *Monocercops nepalensis* sp. nov. A : Male genitalia in caudal view, aedeagus and left valva omitted [Grc-3221, paratype] — B : Aedeagus [ditto] — C : Ditto [Grc-1449, paratype] — D : Seventh and eighth abdominal segments of male in ventral view [Grc-3221, paratype].

resplendens. (Five slides examined.)

Female genitalia (Fig. 4) : Papilla analis moderate in length, longer than eighth abdominal segment. Eighth abdominal segment with membranous ventrum covered with dense microspines. Ostium bursae occupying about 1/3 width of eighth abdominal segment, surrounded by very narrow antevaginal and postvaginal lamellae ; antrum nearly tubular, very slightly dilate caudad, lined with spines around central area ; corpus bursae ellipsoidal in form ; a single round signum surrounded by 10-12 moderately long and many shorter lanceolate sclerites, the longest sclerite being at most 1/3 as long as apophysis posterioris. The other characters are very similar to those of *M. resplendens*. (Three slides examined.)

Specimens examined : 15♂♂ & 3♀♀. Holotype : ♂, Rupakot Tal (alt. 750 m), nr. Pokhara, Nepal, em. 22/v/1968, ex *Castanopsis indica* (Np1-52), T. Kumata leg., Gen. sl. no. Grc-5328, in

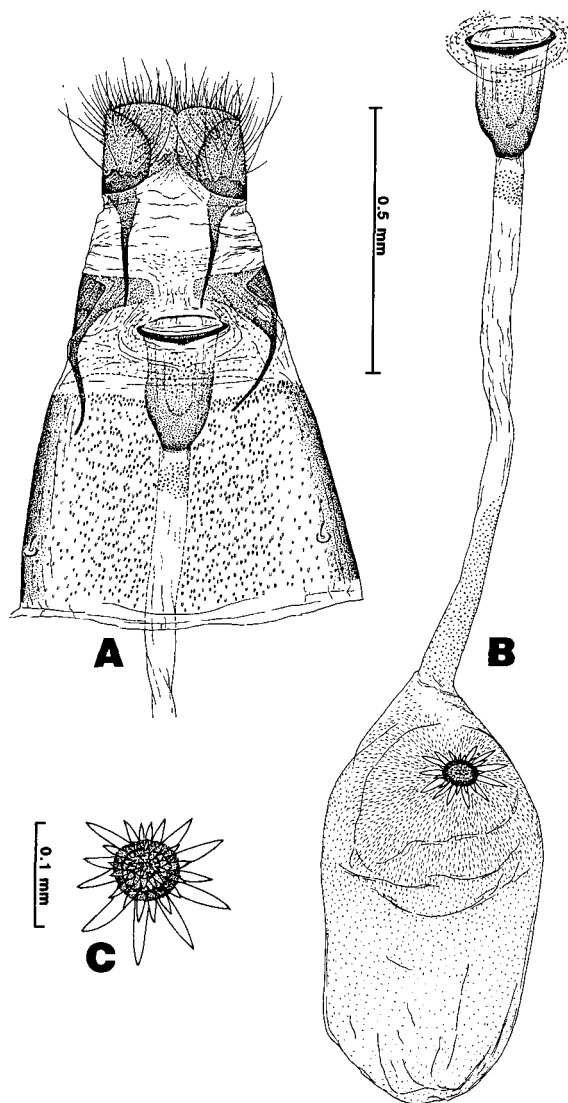


Fig. 4. *Monocercops nepalensis* sp. nov. A: Female terminalia in ventral view, apical part of bursa copulatrix omitted [Grc-3242, paratype] — B: Bursa copulatrix [ditto] — C: Signum enlarged [Grc-3243, paratype].

EIHU. Paratypes: NEPAL — 3♂♂, with same data as holotype except for dates emerged, 22-31/v/1968; 1♂ & 1♀, Ditto, 20/v/1968, T. Kumata leg.; 10♂♂ & 2♀♀, Godawari (alt. 1,500-2,000), Kathmandu Valley, em. 2-6/x/1983, ex *C. indica* (Np1-540), T. Kumata leg.; 3♂♂ & 1♀ in EDAK, 1♂ & 1♀ in BMNH and the other specimens in EIHU.

Distribution: Nepal.

Food plant: *Castanopsis indica* A. DC. (Fagaceae).

Remarks: The new species seems to be closest to *M. resplendens* among the members of the genus *Monocercops* on account of the presence of a comb on the male

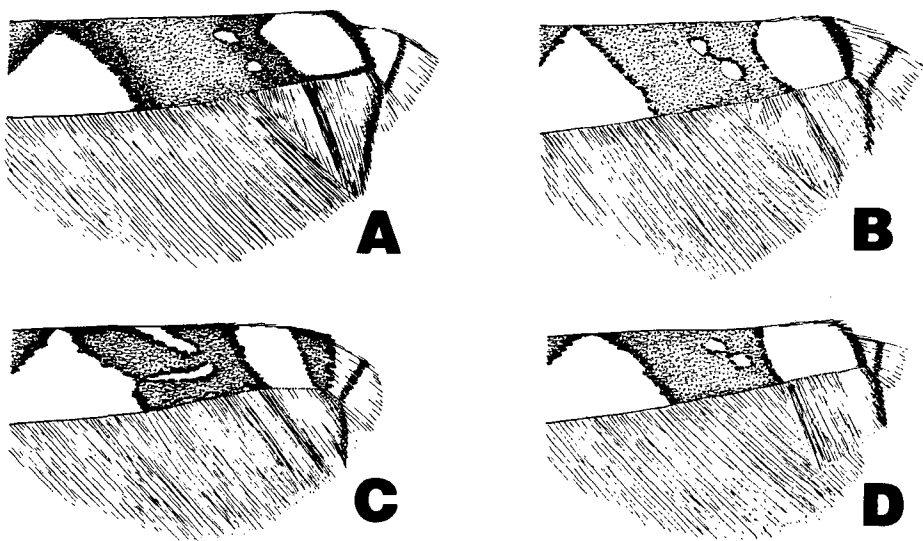


Fig. 5. Apical parts of fore wings of *Monocercops* spp. A: *M. resplendens* (Stainton) — B: *M. nepalensis* sp. nov. — C: *M. triangulata* sp. nov. — D: *M. thoi* sp. nov.

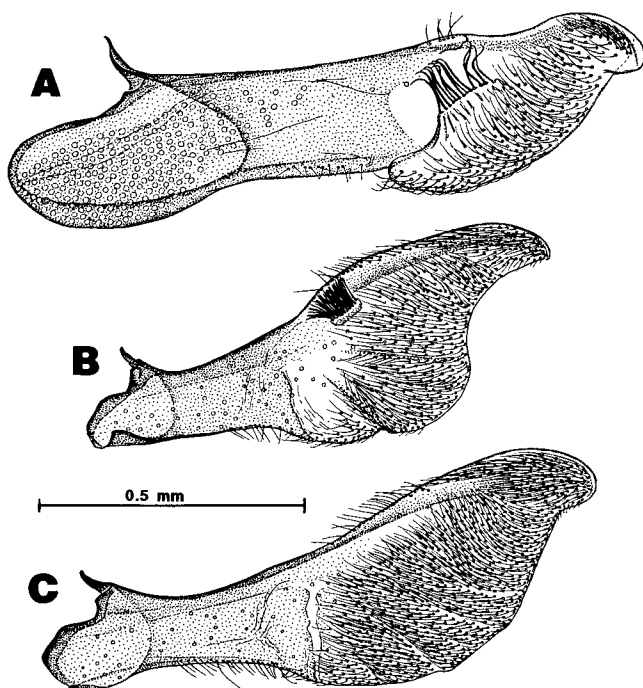


Fig. 6. Right valvae of *Monocercops* spp. A: *M. resplendens* (Stainton) [BM-23937] — B: *M. nepalensis* sp. nov. [Grc-1449, paratype] — C: *M. thoi* sp. nov. [Grc-5324, paratype].

valva, but it is clearly distinguished from the latter by the different shape of the comb and valva, by the absence of a row of spines on mesal margins of the ventral incision of the male eighth abdominal segment, by the shorter lanceolate sclerites surrounding the female signum, and by the fore wing with two white dots arranged in a line oblique to the internal margin of the preapical white blotch.

Monocercops thoi sp. nov.

[Figs. 5(D), 6(C), 7, 8, 14 (E-F), 16(C), 17(A) and 18(B)]

♂ ♀: Expanse of wings: 8.3–9.7 mm (9.5 mm in holotype, 9.09 mm on average of 20 specimens). Length of fore wing: 4.0–4.6 mm (4.5 mm in holotype, 4.35 mm on average of 20 specimens).

Face and head including minute tufts above eyes brilliantly whitish. Maxillary palpus whitish, with a fuscous stripe on outer side apically. Labial palpus whitish, the second segment slightly thickened below towards apex, with outer side fuscous, the apical segment with a narrow fuscous stripe on lower side. Antenna about 1.8 times as long as fore wing, dark fuscous, narrowly whitish below towards base; scape slightly thickened, gray, with a thick grayish tuft on dorsal side, the tuft being a little longer than head. Thorax dorsally ochre-brown with a small white dot at posterior corner, the ventral face whitish with a grayish area below wings. Legs are obviously not different from those of the preceding two species in colouration. Abdomen fuscous dorsally, brilliantly white ventrally with five to six oblique grayish bands; anal extremity whitish in male and blackish in female.

Fore wing deep yellowish-brown in ground, nearly as dark as that of *M. resplendens* and deeper than that of *M. nepalensis*, with three brilliantly white blotches as in the preceding two species, the blotches being internally and externally margined with black; the first placed near base, subtriangular, widest on hind margin of wing, slightly detached from wing-base, with its costal apex reaching costal margin of wing; the second in middle of wing, triangular, a little narrower than the first, with its costal apex touching costa; the third at apex of wing, obliquely quadrangular, with its blackish external margin conspicuously wider than its internal one; two small, black-margined white dots placed in disc just before the third blotch, arranged in a line oblique to internal margin of the blotch as in *M. nepalensis* (see Fig. 5: D); cilia around apex of wing whitish, with a straight blackish line placed beyond external black margin of the third blotch and forming a Y-shaped mark together with the latter; cilia on hind margin dark gray. Hind wing and its cilia gray.

Male genitalia (Figs. 6: C; & 7): Tegumen slender, long, about as long as valva, weakly sclerotized laterally, with 12–22 (14 or 15 in holotype) slender setae occurring on median area along ventral margin of each lateral sclerite; a narrowly sclerotized dorsal band crossing tegumen at basal 2/5. Valva widely wing-shaped, tapering towards base and apex, with round apex slightly bent ventrally; any trace of comb not seen in disc of valva; dense, slender setae occurring in disc of valva from basal 2/5 to apex; moderately long and slender androconial scales scattered on outer surface of valva as in *M. nepalensis*, much sparser than in *M. resplendens*. Vinculum moderate in width, Y-shaped in ventral view, with saccus short and cylindrical as in *M. nepalensis*. Aedeagus a little shorter than valva, slightly curved, tubular,

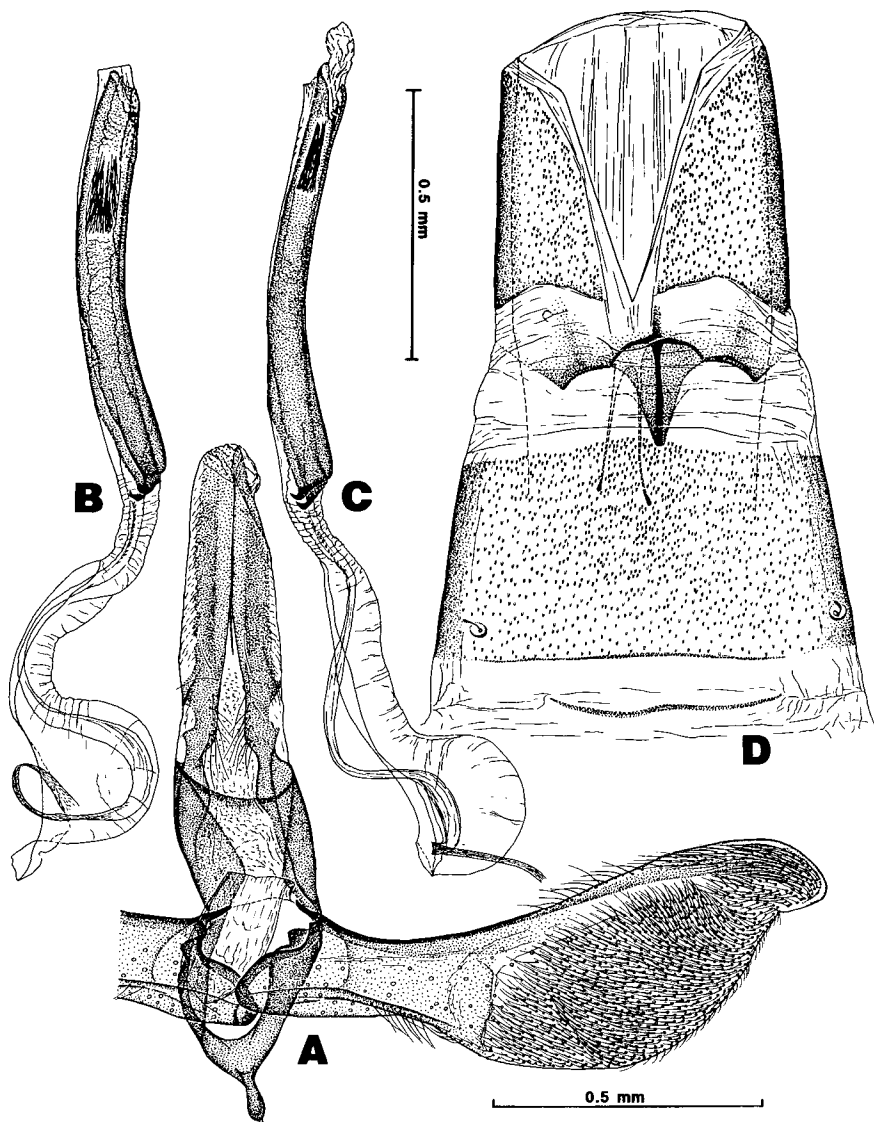


Fig. 7. *Monocercops thoi* sp. nov. A : Male genitalia in caudal view, aedeagus and left valva omitted [Grc-3734, holotype] — B : Aedeagus [ditto] — C : Ditto [Grc-5324, paratype] — D : Seventh and eighth abdominal segments of male in ventral view [holotype].

obliquely truncate apically ; vesica with a bundle of needle-shaped fine cornuti and a small acute projection near apex of aedeagus ; a tubular anellus bearing minute spines near apex of aedeagus. Eighth abdominal segment with a dorsal apodeme elongate-triangular and paired ventral invaginations slender and about 1.5 times as long as dorsal apodeme ; mesal margins of ventral incision smooth, without any spines as in *M. nepalensis*. (Three slides examined.)

Female genitalia (Fig. 8) : Papilla analis moderately long, a little longer than

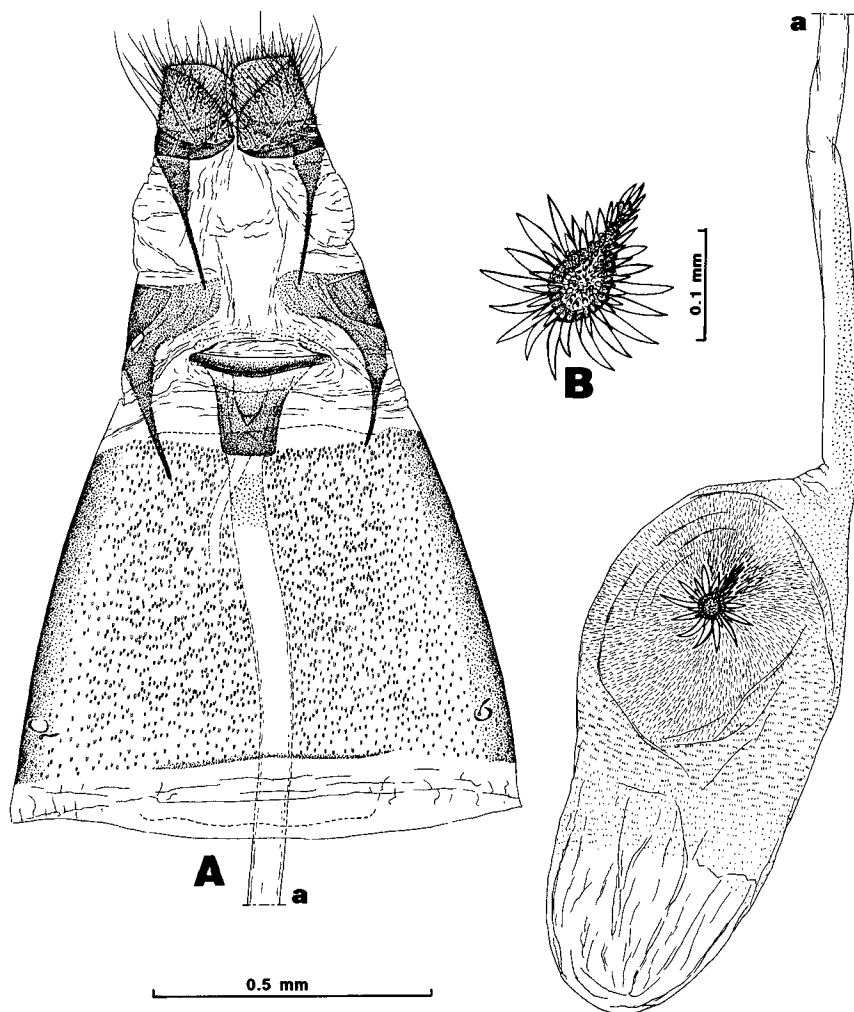


Fig. 8. *Monocercops thoi* sp. nov. A: Female terminalia in ventral view [Grc-3712, paratype] — B: Signum enlarged [Grc-3735, paratype].

eighth abdominal segment, round dorsally and ventrally in lateral view, covered with usual setae and microspines on its caudal area; apophysis posterioris long, longer than apophysis anterioris, widened basally. Ostium bursae large, occupying nearly a half width of eighth abdominal segment, margined with a slender lamella antevaginalis as in *M. resplendens*. Antrum shorter than apophysis anterioris, tapering cephalad, with its sclerotization weakened caudad; ductus bursae long, slender, tubular, lined with acute spines at caudal extremity and with round spines on cephalic 1/3 as in the preceding two species; corpus bursae ellipsoidal or reversed-pyriform, membranous; a single signum slightly prolonged caudad to form a pyriform, surrounded by 15-20 moderately long and many shorter lanceolate sclerites, the longest sclerite is at most 1/3 as long as the apophysis anterioris and

sclerites around the produced area are shorter than those on the other areas; dense, needle-shaped spines occurring around signum, and those on small area caudad of signum are a little thicker than those on the other areas. (Three slides examined.)

Specimens examined: 24♂♂ & 34♀♀. Holotype: ♂, Sungai Buloh, Selangor, W. Malaysia, em. 1/ix/1986, ex *Castanopsis inermis* (2681), T. Kumata leg., Gen. sl. no. Grc-3734, in FRIM. Paratypes: 23♂♂ & 34♀♀, with same data as holotype except for dates emerged, 28/viii-6/ix/1986; 11♂♂ & 17♀♀ in FRIM, 1♂ & 1♀ in BMNH and the other specimens in EIHU.

Distribution: Malaysia (Malay Peninsula).

Food plant: *Castanopsis inermis* Ben. et Hook. (Fagaceae).

Remarks: This new species closely resembles the preceding *M. nepalensis*, and it is hardly distinguishable from the latter by the external colour-pattern except for a longer tuft of the antennal scape and a little deeper ground colour of the fore wing. However, it is at once distinguished from *M. nepalensis* by the genital structure, especially by the absence of comb-like structure of the male valva and by the pyriform signum of the female corpus bursae.

The new species is named in honour of Dr. Tho Yow Pong of the Forest Research Institute of Malaysia, who was Malaysian coordinator of the project in 1986 and 1988.

Monocercops triangulata sp. nov.

[Figs. 5(C), 9 and 14(G-H)]

♀ (♂ unknown). Expanse of wings: 7.6-8.7 mm (in holotype). Length of fore wing: 3.6-4.2 mm (in holotype).

Face and head brilliantly whitish. Maxillary palpus whitish basally and fuscous apically. Labial palpus whitish, with second segment wholly smooth-scaled and brownish. Antenna about 1.2 times as long as fore wing, grayish, becoming white towards base; scape white, with a minute white scaly flap beneath, and without any hairy tuft above. Thorax brilliantly white, with two brownish stripes on pleural area; tegulae ochre-brownish. Legs whitish; anterior four femora fuscous; fore tibia blackish on apical half and middle tibia also black on basal 1/3 and apical 1/3; hind femur with a fuscous median blotch on outer side; hind tibia with median and preapical fuscous blotches on outer side, its bristly scales whitish and apical spurs blackish apically; all tarsi with three or four blackish rings, the rings on hind tarsus being broader than those on the other tarsi.

Fore wing deep yellowish-brown in ground, with three brilliantly white blotches margined with black on their inner and outer sides; first blotch placed near base of wing, wide-triangular, broadest on hind margin, nearly reaching base of wing below wing-fold, with its costal apex touching costa of wing; second blotch in middle of wing, more completely triangular, almost same size with the first, with its costal apex touching costa of wing; third blotch forming a obliquely transverse band near apex of wing, a little wider on costa than on hind margin, followed by a narrow, transverse apical band of ground colour; two short white stripes situated in disc between the second and third blotches, one obliquely running from costa to costal half across wing and the other lying in parallel with hind margin of wing (see Fig. 5: C); cilia around apex of wing whitish, with a narrow, straight blackish median line which forms a Y-shaped mark together with the brownish apical band; cilia on

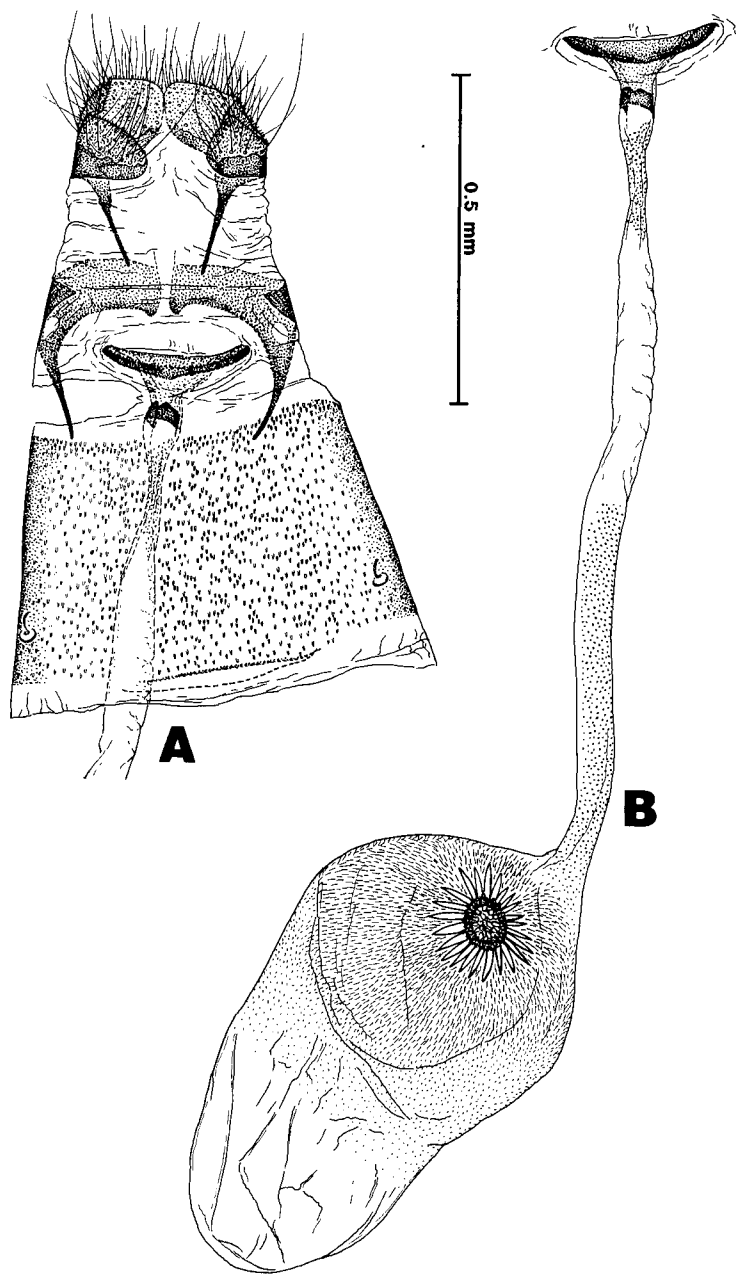


Fig. 9. *Monocercops triangulata* sp. nov. A : Female terminalia in ventral view, apical part of bursa copulatrix omitted [Grc-1500, paratype] — B : Bursa copulatrix [ditto].

terminal and hind margins dark grayish. Hind wing and its cilia dark grayish.

Genitalia (Fig. 9) : Papilla analis moderate in length, a little longer than eighth abdominal segment, covered with usual setae and microspines on caudal area ; apophysis posterioris comparatively short, about as long as apophysis anterioris, widened basally. Ostium bursae large, occupying about half width of eighth abdominal segment, ventrally covered with a lunate lamella antevaginalis ; antrum short, shorter than apophysis, with a short, ring-shaped cephalic sclerite ; ductus bursae long, slender, tubular, lined with acute spines on caudal extremity and also with round spines on cephalic half as in preceding species ; corpus bursae large, membranous, reversed-pyriform ; a single round signum surrounded by 23-25 moderately long lanceolate sclerites and many shorter ones, the longest sclerite being at most $1/2$ as long as apophysis posterioris ; needle-shaped spines densely occurring around signum as in other species of *Monocercops*.

Specimens examined : 2 ♀♀. Holotype : ♀, Adhabar (alt. 300 m), Terai, Narayani, Nepal, em. 22/vii/1968, ex *Castanopsis* sp. (Npl-152), T. Kumata leg., Gen. sl. no. Grc-1448, in EIHU. Paratype : 1 ♀, with same data as holotype except for date emerged, 1/viii/1968, in EIHU.

Distribution : Nepal.

Food plant : *Castanopsis* sp. (Fagaceae).

Remarks : This species is at once distinguished from the other species of *Monocercops* by the absence of dorsal tuft of the antennal scape, by the white thorax, by the two short stripes (instead of two dots in the other species) placed on the disc between second and third white blotches of the fore wing and by the different type of the antrum of the female genitalia. Its relationship to the other members of the genus is not certain, because the male is unknown. It may be isolated, but undoubtedly belongs to the genus *Monocercops* on account of the shape of the bursa copulatrix and the fundamental colour-pattern.

GENUS DEKEIDORYXIS NOV.

Type-species : *Parectopa asynacta* Meyrick, 1918.

Etymology : Dekeidoryxis (G.) = dekos (worm) + eidos (form, likeness) + oryxis (digging, mining) ; feminine.

♂♀. Face and head smooth-scaled ; ocelli absent ; proboscis moderately developed, naked. Maxillary palpus porrect, short, $1/3$ to $1/2$ as long as apical segment of labial palpus, smooth, pointed apically. Labial palpus moderate to short, drooping, sometimes very slightly upturned, smooth-scaled wholly, short-pointed apically. Antenna about as long as fore wing, filiform, simple in both sexes ; scape very slightly thickened, smooth. Legs moderate in length, slightly thicker than those of most members of *Acrocercops*-group, smooth-scaled except for hind tibia, which bears a row of very short bristly scales above, the bristly scales being sometimes not so conspicuous ; hind tarsus a little longer than the tibia.

Fore wing (Fig. 16 : D-F) narrow, lanceolate, rather blunt apically ; discoidal cell occupying about $2/3$ of wing, slightly dilate and obliquely truncate apically, with upper vein obsolescent on proximal part far basal to a point where the vein R_1 branches off ; 12- or 13-veined, the vein Cu_{1b} absent in *D. khooi* (sp. nov.) ; veins all well separate ; R_1 moderate in length, running from basal $2/5$ - $1/2$ of cell to about $2/3$ of costa ; R_2 arising a little before upper angle of cell ; R_3 from upper angle of

cell, nearly parallel with R_4 ; M_3 from lower angle of cell ; Cu_{1a} set close to M_3 and nearly same level with R_2 when Cu_{1b} is present, or apart from M_3 when Cu_{1b} is absent ; Cu_{1b} distinct only on its apical half and apart from Cu_{1a} when it is present ; An obsolescent basally, connected with hind margin of wing at basal $1/3$; ground colour dark bronzy-fuscous, with silvery-white marks such as a fascia and a few strigulae or some strigulae alone. Hind wing $1/2$ to $2/3$ as wide as and about $5/6$ as long as fore wing, long-pointed apically, with cell opened between M_2 and M_3 ; 7-veined, with venation not fundamentally different from that of preceding genus and of most members of *Acrocercops*-group ; cilia long, 3-4 times of wing-width ; ground colour uniformly dark fuscous.

Male genitalia : Whole genital organ very small in comparison with body. Tegumen usually shorter than valva, round apically, weakly sclerotized on dorsal face rather widely, with a few apical and lateral setae ; tuba analis membranous, without subscaphium. Valva rather slender, nearly parallel-sided, round apically, more or less upturned, with a moderate to long comb in disc as in *Acrocercops* and *Artifodina* ; fine setae occurring on inner surface around apex and ventral area ; linear androconial scales not present on outer surface ; transtilla wide and complete. Vinculum U-shaped in ventral view, very prolonged especially on ventrum, with a slender saccus of various length. Aedeagus long, always longer than valva, tubular, tapering apically ; vesica with fine needle-shaped cornuti arranged in an irregular row around apex of aedeagus. Eighth abdominal segment short, nearly half as long as the seventh, shallowly concave along caudal margin of sternum ; two dorsal apodemes short, widened basally, without a sclerotized dorsal ridge on tergite ; a pair of subventral invaginations moderate in length, usually a little shorter than the seventh segment, each containing a bundle of slender androconial scales. Seventh abdominal segment normal in form as in preceding segments.

Female genitalia : Papillae anales somewhat depressed, partly united dorsally, round ventrally, with fine setae along membranous caudal area ; apophysis posterioris moderate in length, slender. Eighth abdominal segment shortly sclerotized dorsally, widely membranous ventrally ; apophysis anterioris slender, usually a little shorter than apophysis posterioris. Ostium bursae placed on ventrum of eighth abdominal segment, small to moderate in opening, with a spatulate or quadrate lamella postvaginalis and a slender lamella antevaginalis in some species including type-species. Antrum short to moderate, well sclerotized on whole length or shortly sclerotized at its cephalic end ; ductus bursae short to long, tubular, membranous, usually lined with spines to a certain extent ; corpus bursae globular or elongate-ellipsoidal : in the former case, it lacks any signum, while in the latter case, its one side is swollen and bears a patch of spine-like signa at the top of this swollen part ; ductus seminalis opening at cephalic end of antrum.

Body chaetotaxy of last instar larva (Fig. 17 : B) : The following description is based on larvae of *D. khooi* (sp. nov.) alone, but it seems to be adopted to the other species because of the similar structures of the exuviated head-capsules remained in the mines.

Seta XD2 absent on prothorax as in *Acrocercops*, *Artifodina*, *Deoptilia*, *Phodoryctis*, *Leucospilapteryx*, *Psydrocercops* and *Borboryctis*. Lateral group consisting of 2 setae on body segments except for ninth and tenth abdominal segments as in most species of *Acrocercops*-group, but unusually L1 being shorter than L3 on the abdo-

men. On first to ninth abdominal segments, D1 apart from and anterior or antero-dorsal to D2. Subventral group consisting of one seta on first and seventh to ninth abdominal segments, two setae on the second and sixth, and three setae on the third to fifth as in *Melanocercops*. Seta V1 present on all abdominal segments as in *Dialectica* and *Monocercops*. Proprioceptor MD1 present on first to ninth abdominal segments, while MV3 absent on the eighth to tenth as in most members of *Acrocercops*-group.

Arrangement of crochets : So far as examined the larva of *D. khooi*, the prolegs on the third to fifth and tenth abdominal segments lacks the crochets entirely.

Larval habit : The members of this genus are leaf-miners on plants of the genus *Maesa* (Myrsinaceae) in the larval stage. In *D. asynacta* and *D. khooi*, the mine starts in a linear and lower epidermal gallery which is formed for a short distance, then enters into the interparenchymal layer usually along the mid vein ; this part of the mine always becomes wider and is somewhat swollen on both the upper and lower sides of the leaf. In *D. maesae*, the larva directly enters into the parenchymal layer, then makes an irregular blotch between veins ; the mine is always swollen as in *D. khooi* and *D. asynacta*. The boat-shaped cocoon of *D. khooi* is situated beside the swollen mine and covered by many grains of frass instead of bubbles seen in most members of the *Acrocercops*-group. Cocoons of the other species are not observed.

Remarks : This new genus undoubtedly belongs to the *Acrocercops*-group defined by Kumata et al. (1988), though it differs in some characters such as the absence of long androconial scales on the male valva, the very short or sometimes indistinct bristly scales on the hind tibia, and the seta L1 on the abdominal segments of the larva being shorter than the seta L3. By these characters it is immediately distinguished from the other genera of the group. Nevertheless, it may be closely related to the genera *Acrocercops* and *Artifodina* in having a single complete comb on the male valva and in lacking the seta XD2 on the prothorax of the last instar larva. It may be separated from them by the two dorsal apodems of the male eighth abdominal segment and by the very different form of the female signa (when they are present) in addition to the characters mentioned above.

Key to the species of *Dekeidoryxis*

1. Fore wing with one transverse silvery-white fascia at about basal 1/4 in addition to costal and hind strigulae ; apical saccus of male vinculum short to moderate, at most 1/3 as long as valva ; female ostium bursae with spatulate or quadrate flap-like lamella postvaginalis. 2
- Fore wing with five whitish costal strigulae and two hind ones, and without such a transverse fascia ; apical saccus of male vinculum long, about 4/5 as long as valva ; female lamella postvaginalis weakly sclerotized, but not forming any distinct flap. *D. maesae* sp. nov.
2. Besides the fascia, fore wing with two vertical strigulae on costa and one on hind margin just before the second costal ; cilia wholly dark bronzy-fuscous, without any fringe line ; comb of male valva consisting of 30-40 teeth ; apical saccus of male vinculum about 1/3 as long as valva ; aedeagus long, about 2 times as long as valva ; female bursa copulatrix long, with a patch of many acute signa. *D. asynacta* (Meyrick)
- Besides the fascia, fore wing with three outward-oblique strigulae on costa and one on hind margin just beyond the first costal ; cilia dark bronzy-fuscous, with a round whitish line around apex of wing ; comb of male valva consisting of 15-20 teeth ; apical saccus of male

vinculum shorter than 1/5 length of valva ; aedeagus moderate in length, about 1.3 times as long as valva ; bursa copulatrix short, without signum. *D. khooi* sp. nov.

Dekeidoryxis asynacta (Meyrick), comb. nov.

[Figs. 10, 12(A), 15(A-B), 16(D) and 18(C-D)]

Parectopa asynacta Meyrick, 1918, Exot. Microlep. 2 : 178 [India (Assam)].

Original description : "♂. 7 mm. Head, palpi, thorax, abdomen glossy dark bronzy-fuscous. Forewings narrowly elongate, short-pointed ; veins all separate ; shining dark bronzy-fuscous ; markings shining silvery-white ; a slender straight transverse fascia at 1/4 ; small transverse spots on costa before middle and at 2/3, and one on dorsum somewhat before second of these : cilia dark fuscous. Hindwings and cilia dark fuscous."

Additional description : ♂ ♀. Expanse of wings : 5.3-7.8 mm (7.00 mm on average of 13 specimens). Length of fore wing : 2.4-3.7 mm (3.32 mm on average of 15 specimens).

Face tinged with leaden lustre. Antenna a little shorter than fore wing, dark fuscous to blackish ; scape smooth, blackish. Legs dark bronzy-fuscous as well as thorax ; femora and tibiae tinged with ochre or gray ; all tarsal segments becoming pale gray apically. Abdomen ventrally banded with leaden gray along caudal margin of each segment.

Fore wing shining bronzy-fuscous in ground colour as described originally, somewhat tinged with gold on hind margin below wing-fold ; a silvery-white fascia at about basal 1/4 slightly detached from hind margin in some specimens and two costal spots reduced in size into small dots in a few specimens ; cilia dark fuscous, without any fringe line.

Male genitalia (Figs. 10 : A-C ; & 12 : A) : Tegumen short, about half as long as valva, widely round apically in ventral view, with two or three subapical and six to ten lateral setae on each side. Valva moderate in length, slightly upturned, nearly parallel-sided or slightly dilate basally, round apically, with a large comb in disc nearly parallel with ventral margin, the comb occupying nearly median half of valva and consisting of 30-40 blunt teeth which are about half as long as saccus ; slender setae scattered on inner surface around apex and ventral margin. Vinculum U-shaped, prolonged ventrally, about as long as valval comb, with saccus slender and about 1/3 as long as valva. Aedeagus about twice as long as valva, tubular, tapering towards acute apex ; vesica with some minute needle-shaped cornuti near apex of aedeagus. Eighth abdominal segment short, about half as long as the seventh, shallowly concave ventrally, with two divergent, short dorsal apodemes and two subventral invaginations, which are nearly as long as the seventh segment and contain a thick bundle of hairy androconial scales. (Four slides examined.)

Female genitalia (Fig. 10 : D-E) : Papilla analis short, about as long as eighth abdominal segment, tapering dorsally and round ventrally in lateral view, with usual setae occurring along caudal margin ; apophysis posterioris slender, moderate in length, slightly longer than apophysis anterioris. Ostium bursae small, occupying about 1/5 width of eighth abdominal segment, with a weakly sclerotized and trapeziform lamella postvaginalis ; antrum slender, short, with an indistinct sclerite at its

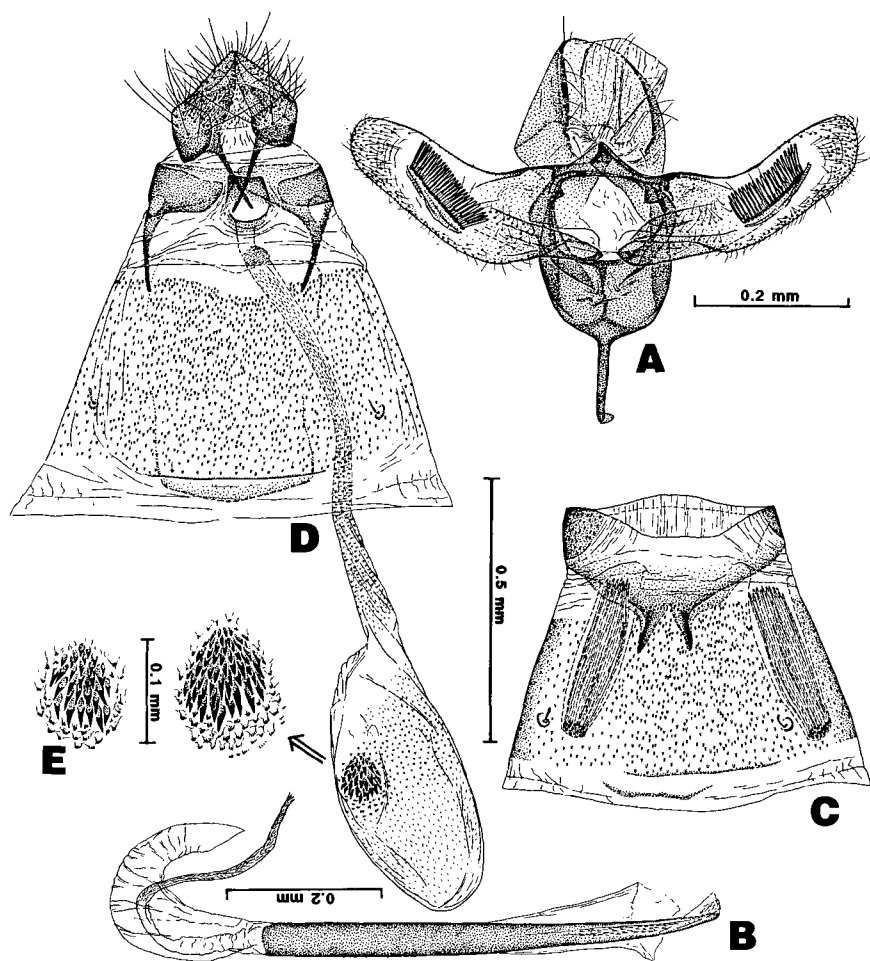


Fig. 10. *Dekeidoryxis asynacta* (Meyrick). A: Male genitalia in caudal view, aedeagus omitted [Grc-3100] — B: Aedeagus [ditto] — C: Seventh and eighth abdominal segments of male in ventral view [ditto] — D: Female terminalia in ventral view [Grc-3202] — E: Signal enlarged [Grc-3103].

cephalic end; ductus bursae slender, tubular, membranous, lined with acute spines on its caudal half and comb-like spines on its cephalic half; corpus bursae ellipsoidal, somewhat more swollen on one side, with a small patch of many spine-like signa on the swollen area. (Three slides examined.)

Specimens examined: 7♂♂ & 9♀♀. NEPAL — 5♂♂ & 9♀♀, Thankot (alt. 1,700–2,000 m), Kathmandu Valley, Bagmati, em. 31/ix–4/x/1983, ex *Maesa chisia* (Npl-690), T. Kumata leg.; 1♂, Godawari, Kathmandu Valley, em. 29/vii/1983, ex *M. chisia* (Npl-175), T. Kumata leg.; 1♂, Ditto, 24/v–6/vi/1983, Allen, Brendell, Robinson & Tuck leg.; 2♂♂ & 2♀♀ in EDAK, 1♂ & 1♀ in BMNH and the other specimens in EIHU.

Distribution: India (Khasi Hills), and Nepal (new record).

Food plant: *Maesa chisia* Hamilton (Myrsinaceae).

Dekeidoryxis maesae sp. nov.

[Figs. 11, 12(B), 15(E-F), 16(E), 18(E-F) and 19(A-B)]

♂ ♀. Expanse of wings: 6.3-7.6 mm (6.8 mm in holotype, 6.87 mm on average of 20 specimens). Length of fore wing: 2.9-3.5 mm (3.2 mm in holotype, 3.24 mm on average of 20 specimens).

Face white; head whitish, becoming gray posteriorly in most specimens, but in holotype and some specimens it is wholly dark grayish. Maxillary and labial palpi white, the latter being blackish at apical extremity. Antenna as long as or a little longer than fore wing, dark fuscous, below narrowly white towards base; scape white in most specimens or grayish in holotype and some specimens. Thorax dark bronzy-fuscous. Legs white; anterior four femora dark fuscous, and tibiae with a median dark fuscous ring and an apical one; hind tibia dark fuscous except for a subapical white ring; all tarsi with four narrow blackish rings. Abdomen dorsally dark fuscous, ventrally white with five fuscous bands.

Fore wing brilliantly dark bronzy-fuscous in ground, somewhat tinged with leaden lustre along hind margin below wing-fold towards base, with five brilliantly white costal strigulae and two hind dots; the first costal strigula placed just before middle, oblique externally, occupying half width across wing, rather narrow, but widest among the strigulae; the second strigula placed beyond middle and the third at about apical 1/3, both being parallel with the first; the fourth at apical 1/6, set close to the fifth, both being shorter and smaller than the preceding strigulae; the first hind dot at tornus, and the second before apex of wing; wing-apex beyond white marks roundly jet black; cilia around apex and along termen bronzy-fuscous, with a round whitish subapical line; cilia along hind margin dark fuscous. Hind wing and its cilia dark fuscous, tinged with bronzy gloss.

Male genitalia (Figs. 11: A-C; & 12: B): Tegumen about 2/3 as long as valva, widely round apically in ventral view, with one or two subapical and one to three lateral setae on each side. Valva well upturned, parallel-sided or slightly dilate basally, and blunt apically, with a short, curved comb obliquely placed in disc between basal 1/2 and 3/4, the comb consisting of 15-20 blunt teeth; slender setae occurring on apical and ventral areas. Vinculum U-shaped, well prolonged ventrally, nearly twice as long as valval comb, with saccus narrow, and about 4/5 as long as valva. Aedeagus about 2.5 times as long as valva, slender, tubular, tapering apically; vesica with an irregular row of very fine, spine-like cornuti on apical half of aedeagus. Eighth abdominal segment short, about half as long as the seventh, with two short dorsal apodemes nearly parallel to each other, and with two subventral invaginations, which are as long as the seventh segment and each contains a thin bundle of slender androconial scales. (Six slides examined).

Female genitalia (Fig. 11: D-E): Papilla analis rather short, about as long as eighth abdominal segment, tapering dorsally and round ventrally in lateral view; apophysis posterioris widened basally, a little longer than apophysis anterioris. Ostium bursae very small, occupying nearly 1/5 width of eighth abdominal segment, with lamella postvaginalis weakened caudad in its sclerotization and not forming a distinct shape. Antrum well sclerotized, shortly cup-shaped; ductus bursae long, slender, tubular, faintly scobinate on its caudal half; corpus bursae elongate-

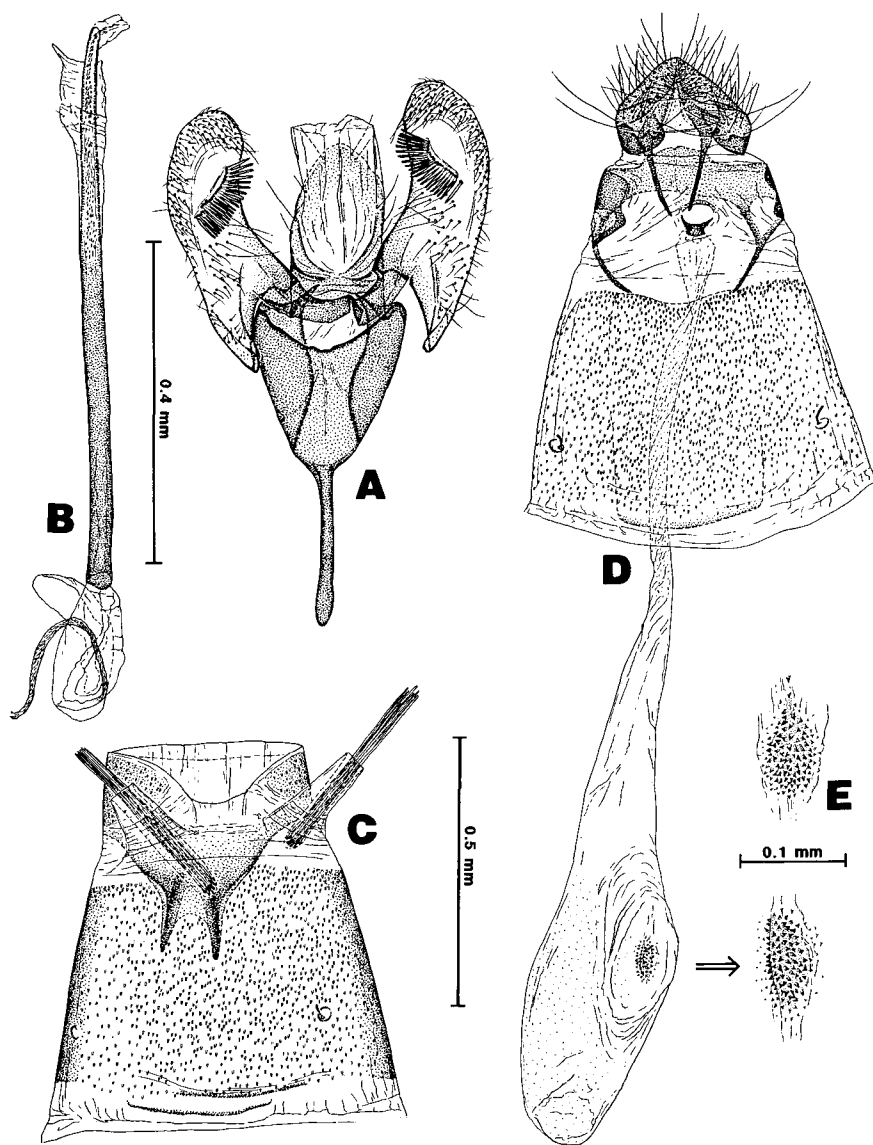


Fig. 11. *Dekeidoryx maesae* sp. nov. A: Male genitalia in caudal view, aedeagus omitted [Grc-2274, paratype] — B: Aedeagus [ditto] — C: Seventh and eighth abdominal segments of male in ventral view [ditto] — D: Female terminalia in ventral view [Grc-2271, paratype] — E: Signa enlarged [Grc-3219, paratype].

ellipsoidal, but well swollen on one side, at a peak of this swollen part with a small patch lined by many trigonal signa. (Five slides examined.)

Specimens examined: 16♂♂ & 22♀♀. Holotype: ♂, Kalimpong, W. Bengal, India, em. 13/iii/1978, ex *Maesa macrophylla* (Ind-67), S.F. Sakagami & T. Kumata leg., Gen. sl. no. Grc-5329, in EIHU. Paratypes: NEPAL — 2♀♀, Balaju (alt. 1,400 m), Kathmandu Valley, em. 13/ix/1983, ex *M. macrophylla* (Npl-637), T. Kumata leg.; 1♂, Kakani, Kathmandu Valley, 1-2/vi/1983, Allen, Brendell, Robinson & Tuck leg.; 3♂♂ & 3♀♀, Malipu — Suri Dhoban (alt. 1,000-1,100 m), Janakpur, em. 12/viii-5/ix/1983, ex *M. macrophylla* (Npl-309), T. Kumata leg.; 2♂♂ & 2♀♀, Suri Dhoban — Gongar (alt. 1,100-1,300 m), Janakpur, em. 7-11/ix/1983, ex *M. chisia* (Npl-399), T. Kumata leg.; 2♂♂ & 2♀♀ in EDAK, 1♂ in BMNH and the other specimens in EIHU. INDIA — 2♀♀, Kalimpong, W. Bengal, em. 18-22/iii/1978, ex *M. macrophylla* (Ind-59), S.F. Sakagami & T. Kumata leg.; 9♂♂ & 13♀♀, with same data as holotype except for dates emerged, 3-18/iii/1978; 4♂♂ & 12♀♀ in ZSIC, 1♂ & 1♀ in BMNH and the other specimens in EIHU.

Distribution: India (W. Bengal), and Nepal.

Food plants: *Maesa chisia* Hamilton and *M. macrophylla* (Wall.) A. DC. (Myrsinaceae).

Remarks: This new species is apparently related to *D. asynacta* in the genital structures of both the male and female, but is at once distinguished from the latter by the very different colour-pattern of the fore wing as well as by detailed genital characters such as the shorter comb of the valva, the longer saccus, the wholly sclerotized cup-shaped antrum, and the short trigonal signa.

Dekeidoryxis khooi sp. nov.

[Figs. 12(C), 13, 15(C-D), 16(F), 17(B) and 19(C-D)]

♂♀. Expanse of wings: 5.2-6.7 mm (6.0 mm in holotype, 6.07 mm on average of six specimens). Length of fore wing: 2.4-3.2 mm (2.8 mm in holotype, 2.84 mm on average of seven specimens).

Face brightly dark grayish; head dark bronzy-fuscos, somewhat paler anteriorly. All palpi dark fuscous; antenna a little shorter than fore wing, dark fuscous. Thorax dark bronzy-fuscos. Legs dark fuscous; fore coxa glossy white on its basal half; anterior four tibiae whitish apically; hind coxa basally and femur entirely whitish, the tibia with a narrow white apical ring; all tarsi ringed with white on basal half of each segment. Abdomen dark fuscous dorsally, grayish ventrally, with five fuscous transverse ventral bands.

Fore wing with vein Cu_{1b} absent; ground colour glossy dark bronzy-fuscos, with a transverse fascia at about basal 1/4, three costal strigulae and a hind one arranged between this fascia and apex of wing, all silvery-white; the fascia perpendicular, slightly widened towards hind margin of wing; the first costal strigula situated just beyond middle, very slightly oblique outwardly, occupying nearly half width of wing; the second costal at about apical 1/3, closer to the first than to the third, nearly as large as the first; the third costal near apex of wing, smallest of the white markings; the hind strigula at about apical 1/3, a little beyond the first costal, elongate-triangular or wedge-shaped, extending to half width of wing; cilia dark bronzy-fuscos, with a round subapical whitish line around apex of wing, those along hind margin dark gray. Hind wing and its cilia dark fuscous, tinged with bronzy gloss.

Male genitalia (Figs. 12: C; & 13: A-C): Tegumen short, about half as long as

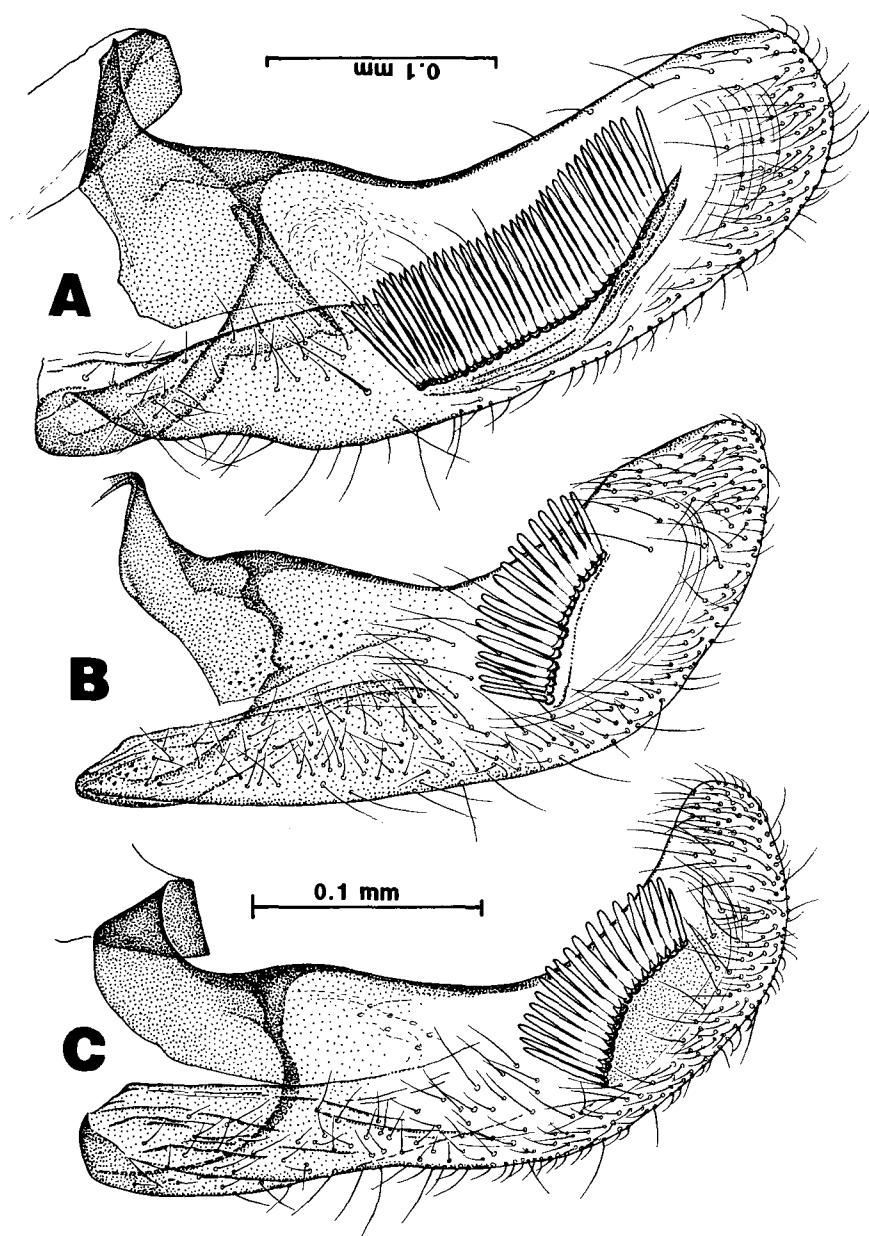


Fig. 12. Right valvae of *Dekeidoryxis* spp. A : *D. asynacta* (Meyrick) [BM-23952] — B : *D. maesae* sp. nov. [Grc-5329, holotype] — C : *D. khooi* sp. nov. [Grc-3721, paratype].

valva, slightly mucronate apically, with two or three apical setae and five to eight lateral ones on each side. Valva rather slender, upturned, nearly parallel-sided, round apically, with a short comb placed in disc between basal $1/2$ and $3/4$ and slightly oblique towards ventral margin of valva, the comb consisting of 15–20 blunt teeth as in the preceding *D. maesae*; slender setae scattered on apical and ventral areas. Vinculum U-shaped, prolonged ventrally, nearly as long as comb, with saccus very short, shorter than $1/5$ length of valva. Aedeagus about 1.3 times as long as valva, tubular, obliquely truncate apically; vesica with sparse cornuti near apex of aedeagus. Eighth abdominal segment about half as long as the seventh, concave along caudal margin of ventrum, with two short, triangular dorsal apodemes and with two short subventral invaginations, which are about $2/3$ as long as the seventh abdominal segment and each contains a rather thick bundle of slender androconial scales. (Two slides examined).)

Female genitalia (Fig. 13 : D) : Papillae anales widely united each other dorsally and round ventrally, with usual slender setae on weakly membranous caudal area; apophysis posterioris slender, moderate in length, about as long as apophysis anterioris. Eighth abdominal segment a little shorter than papilla analis, somewhat prolonged on dorsum; apophysis anterioris widened towards base. Ostium bursae rather large, occupying $1/4$ to $1/3$ width of eighth abdominal segment, with lamella postvaginalis well prolonged caudad to form a quadrate or spatulate flap, and with

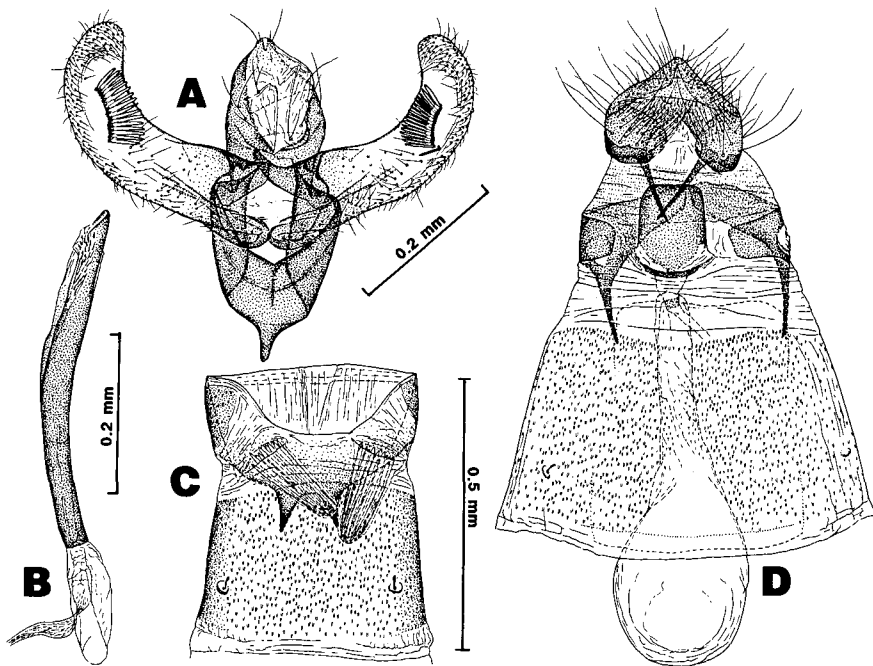


Fig. 13. *Dekeidoryxis khooi* sp. nov. A : Male genitalia in caudal view, aedeagus omitted [Grc-3838, holotype] — B: Aedeagus [ditto] — C: Seventh and eighth abdominal segments of male in ventral view [ditto] — D: Female terminalia in ventral view [Grc-3722, paratype].

lamella antevaginalis narrowly covering on ventral side of the opening. Antrum shortly cup-shaped, weakly sclerotized only on its cephalic end narrowly; ductus bursae very short, shorter than seventh abdominal segment, tubular, membranous, lined with acute spines on median area sparsely; corpus bursae globular, membranous, without any signum and scobination. (Three slides examined.)

Specimens examined: 4♂♂ and 4♀♀. Holotype: ♂, Maxwell Hills (Bukit Larut), nr. Taiping, Perak, Malaysia, em. 13/xi/1986, ex *Maesa ramentacea* (2895), T. Kumata leg., Gen. sl. no. Grc-3838, in FRIM. Paratypes: MALAYSIA — 2♂♂ & 2♀♀, with same data as holotype except for dates emerged, 8-13/xi/1986; 1♂ & 2♀♀, Telok Bahang, Pinang Is., em. 16/x-10/xi/1986, ex *M. ramentacea* (2904), T. Kumata leg.; 1♂ & 2♀♀ in FRIM and the other specimens in EIHU.

Distribution: Malaysia (Malay Peninsula).

Food plant: *Maesa ramentacea* Wall. (Myrsinaceae).

Remarks: *D. khooi* is very similar to *D. asynacta* in the colour-pattern of the fore wing. On the other hand, it is somewhat similar to *D. maesae* in the structure of the male genitalia. It is, however, clearly distinguished from both *D. asynacta* and *D. maesae* by the very short ductus bursae and the simple corpus bursae without any signum in the female genitalia as well as by the other detailed characters such as the much shorter saccus of the male vinculum, the shorter male aedeagus and the absence of the vein Cu_{1b} of the fore wing. These characters may be primitive (the shorter female bursa copulatrix without any signum, the shorter saccus and the shorter aedeagus) or derived (the absence of vein Cu_{1b} of the fore wing), and suggest that the species is isolated.

This new species is dedicated to Dr. Khoo Soo Ghee of Zoological Department, University of Malaya, who kindly helped me during my stay in Malaysia.

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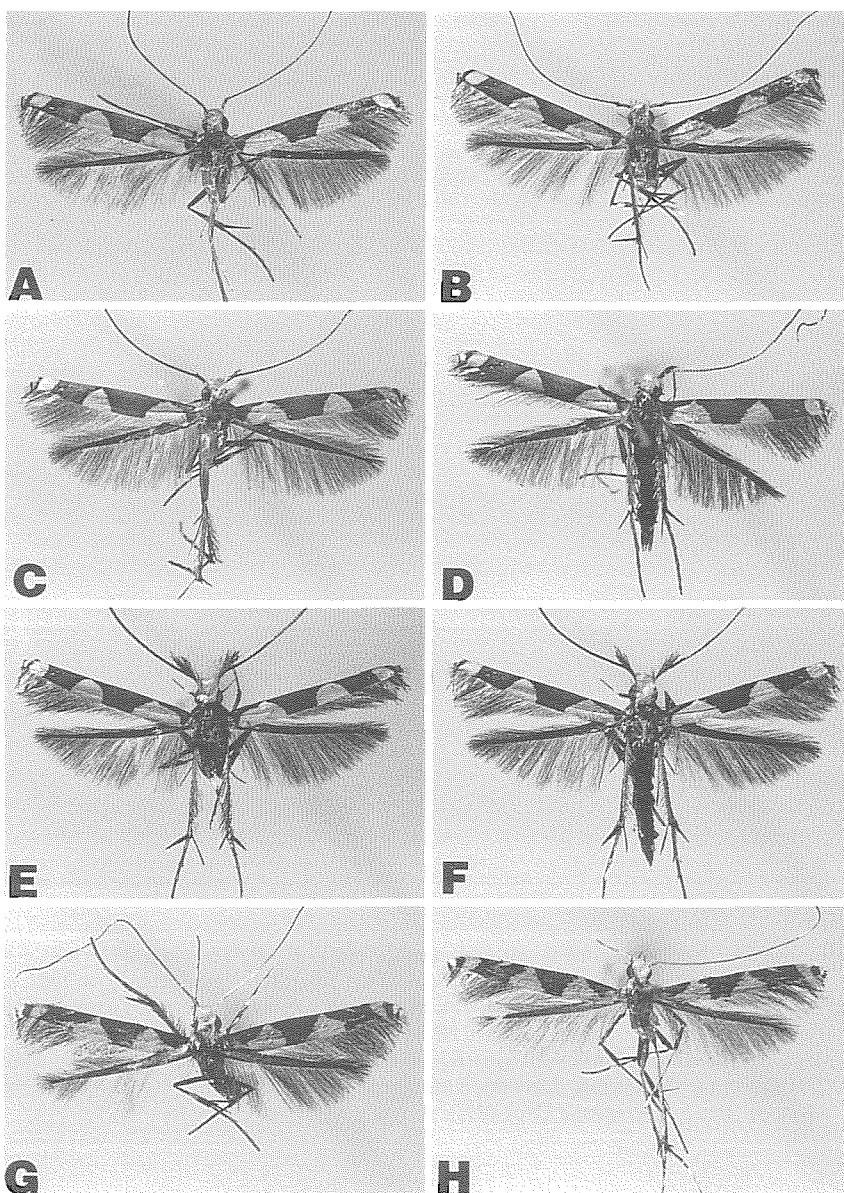
I also express my cordial thanks to the following members of the projects for their kindly helping me in various ways: Dr. Dinendra Raychaudhuri and Dr. Basant K. Agarwala, both of the Zoological Department, University of Calcutta; Dr. G.S.

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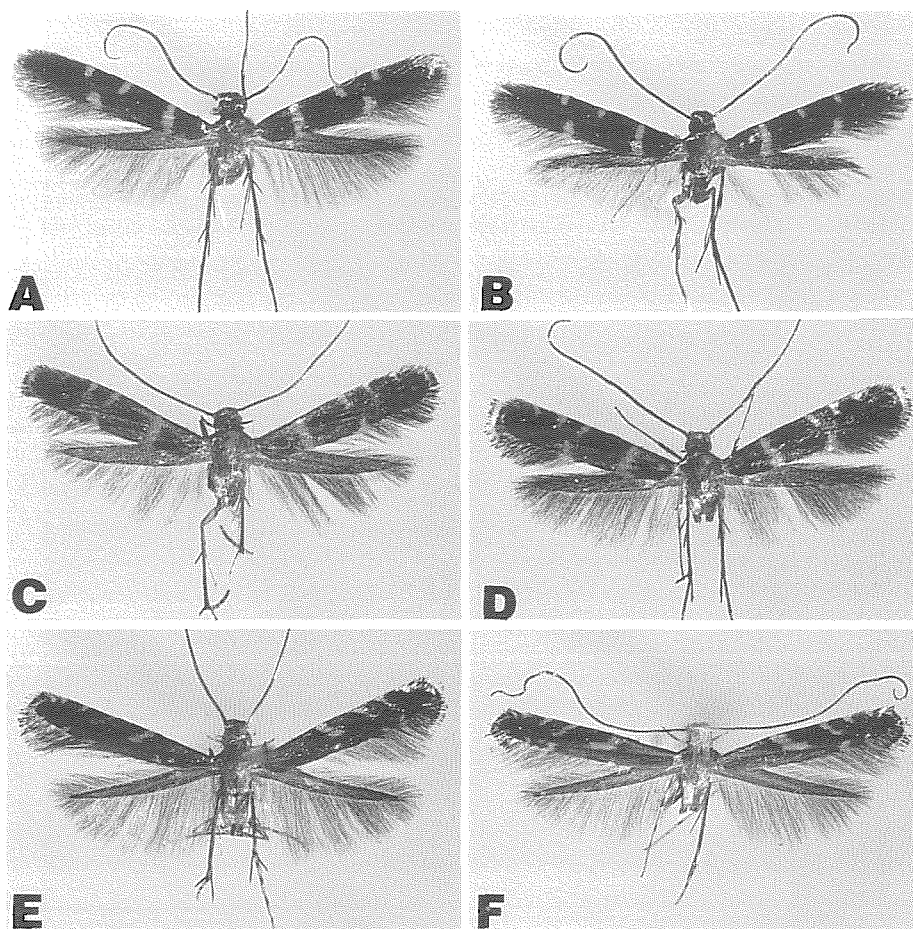
Last but not least, I express my sincere thanks to Prof. S. Takagi and Dr. M. Suwa of the Entomological Institute, Hokkaidō University, for their kindness in reading through this manuscript.

LITERATURE

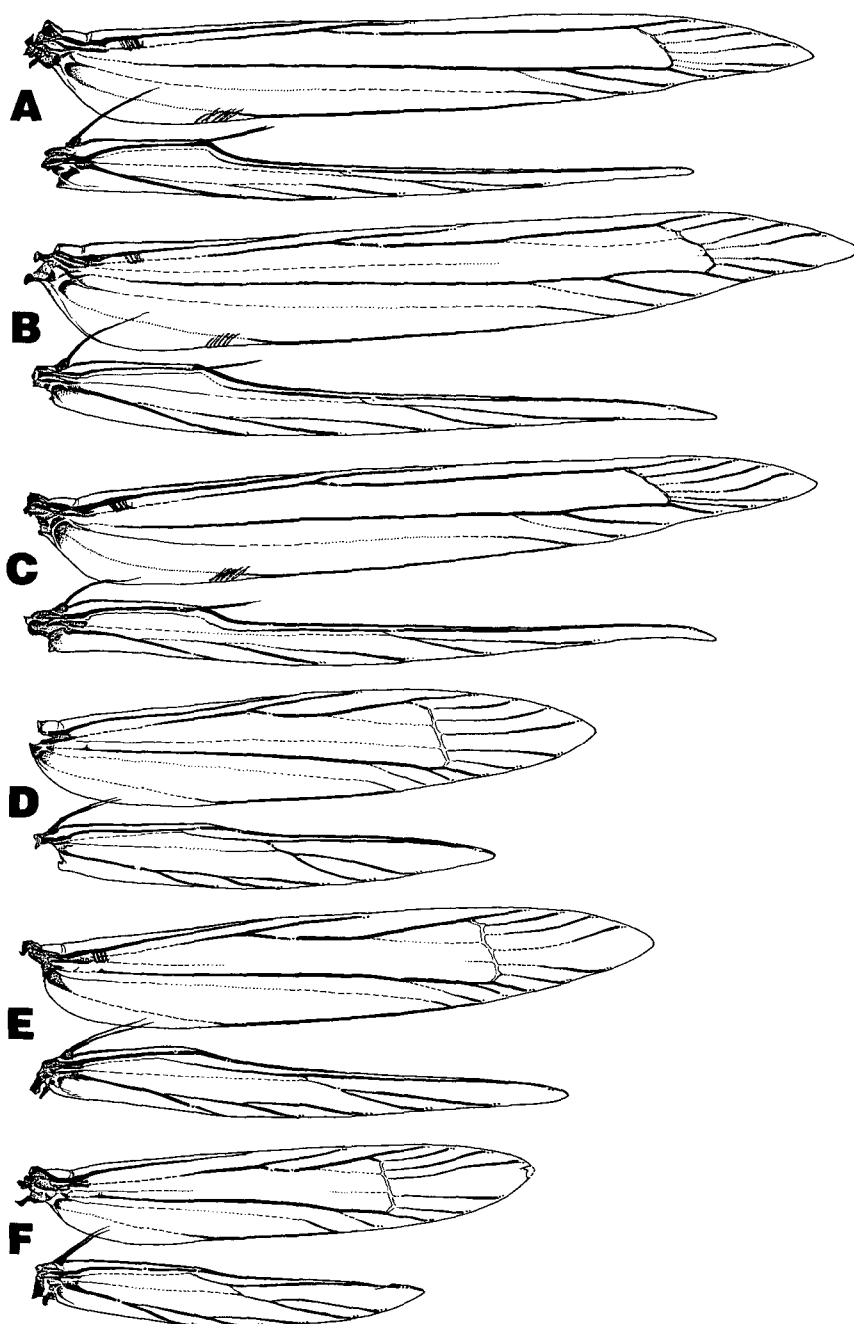
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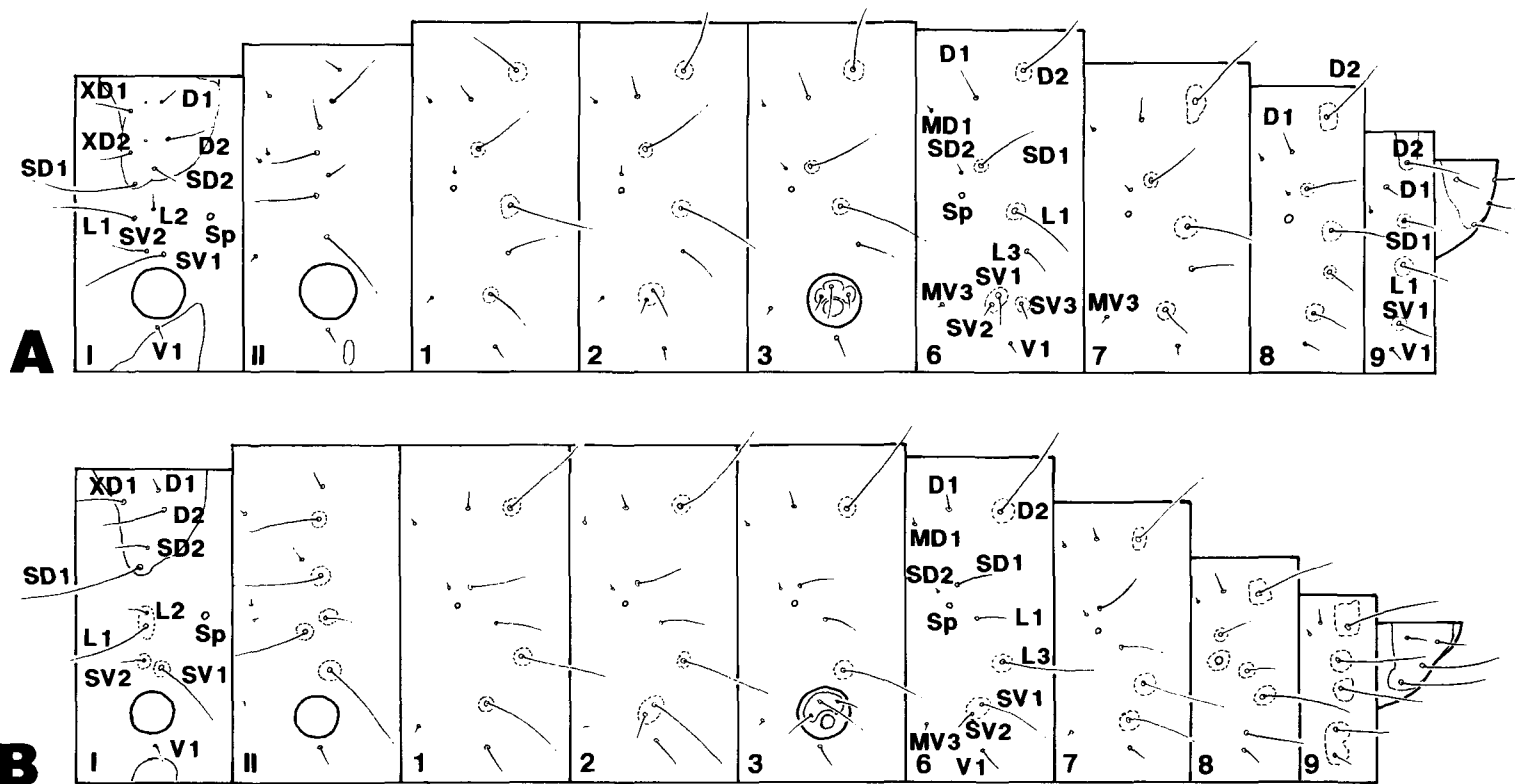
Pl. I: Fig. 14. Adult specimens of *Monocercops* spp. A: *M. resplendens* (Stainton) [♀, Pathraia (alt. 300 m), Terai, Narayani, Nepal, 9-10/ix/1983] — B: Ditto [♀, ditto] — C: *M. nepalensis* sp. nov. [♂, holotype] — D: Ditto [♂, paratype, Rupakot Tal, nr. Pokhara, Nepal, em. 31/v/1968, ex *Castanopsis indica* (Npl-52)] — E: *M. thoi* sp. nov. [♂, holotype] — F: Ditto [♂, paratype, Sungai Buloh, Selangor, Malaysia, em. 6/ix/1986, ex *Castanopsis inermis* (2681)] — G: *M. triangulata* sp. nov. [♀, holotype] — H: Ditto [♀, paratype, Adhabar (alt. 300 m), Terai, Narayani, em. 1/viii/1968, ex *Castanopsis* sp. (Npl-152)].



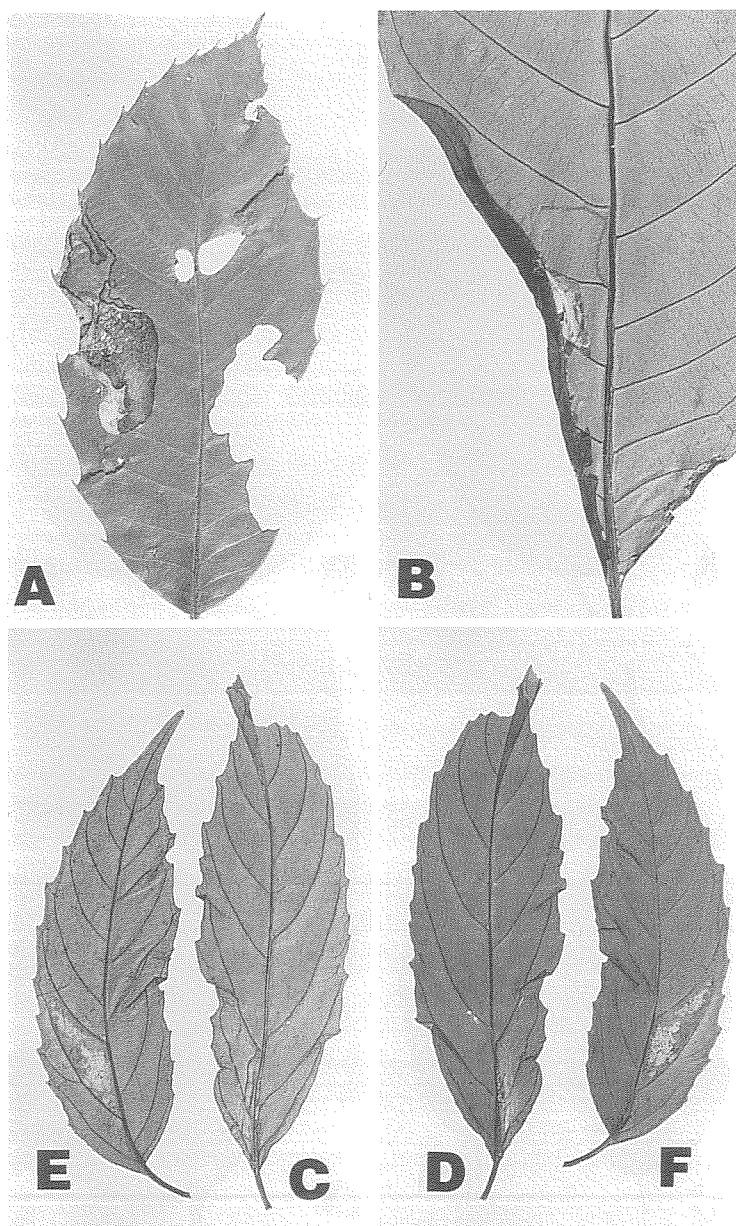
Pl. II : Fig. 15. Adult specimens of *Dekeidoryxis* spp. A : *D. asynacta* (Meyrick) [♀, Thankot (alt. 1,700-2,000 m), Kathmandu Valley, Bagmati, Nepal, em. 31/x/1983, ex *Maesa chisia* (Npl-690)] — B : Ditto [♂, ditto] — C : *D. khooi* sp. nov. [♂, holotype] — D : Ditto [♀, paratype, Maxwell Hills, nr. Taiping, Perak, Malaysia, em. 8/xi/1986, ex *Maesa ramentacea* (2895)] — E : *D. maesae* sp. nov. [♂, holotype] — F : Ditto [♀, paratype, Balaju (alt. 1,400 m), Kathmandu Valley, Bagmati, Nepal, em. 13/ix/1983, ex *Maesa macrophylla* (Npl-637)].



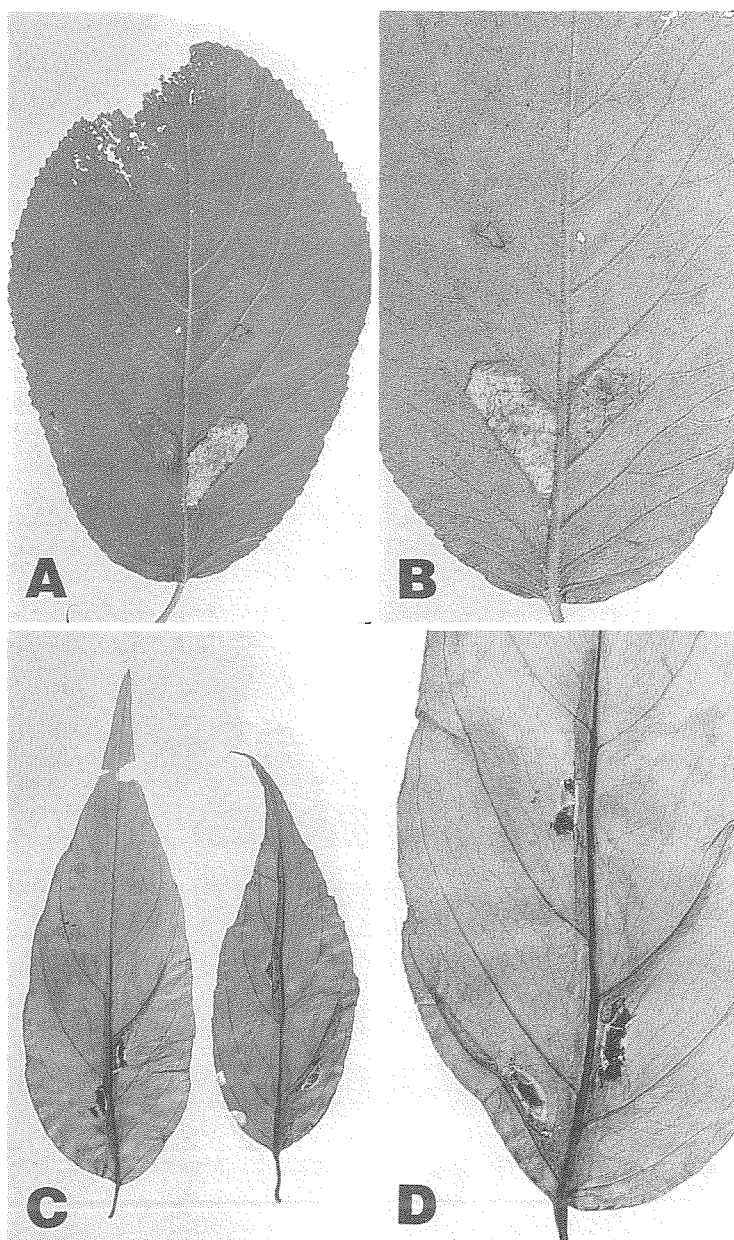
Pl. III: Fig. 16. Wing venation. A: *Monocercops resplendens* (Stainton) [♀, Grc-3569] — B: *Monocercops nepalensis* sp. nov. [♀, Grc-1667] — C: *Monocercops thoi* sp. nov. [♀, Grc-3842] — D: *Dekeidoryxis asynacta* (Meyrick) [♀, Grc-3570] — E: *Dekeidoryxis maesae* sp. nov. [♀, Grc-2371] — F: *Dekeidoryxis khooi* sp. nov. [♀, Grc-3844].



Pl. IV: Fig. 17. Body chaetotaxy of last instar larva. A: *Monocercops thoi* sp. nov. [breeding no. 2681] — B: *Dekeidoryxis khooi* sp. nov. [breeding no. 2904].



Pl. V : Fig. 18. Larval leaf-mines. A : *Monocercops nepalensis* sp. nov. on *Castanopsis indica* (upper side) [breeding no. Npl-54] — B : *Monocercops thoi* sp. nov. on *Castanopsis inermis* (lower side) [breeding no. 2681] — C : *Dekeidoryxis asynacta* (Meyrick) on *Maesa chisia* (lower side) [breeding no. Npl-416] — D : Ditto (upper side) — E : *Dekeidoryxis maesae* sp. nov. on *Maesa chisia* (lower side) [breeding no. Npl-399] — F : Ditto (upper side).



Pl. VI: Fig. 19. Larval leaf-mines. A : *Dekeidoryxis maesae* sp. nov. on *Maesa macrophylla* (upper side) [Balaju, Kathmandu Valley, Nepal] — B : Ditto (lower side, enlarged) — C : *Dekeidoryxis khooi* sp. nov. on *Maesa ramentacea* (lower side) [breeding no. 2895] — D : Ditto (enlarged, showing cocoons beside mines).